THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 35 JULY, 1934 No. 4

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No. 28

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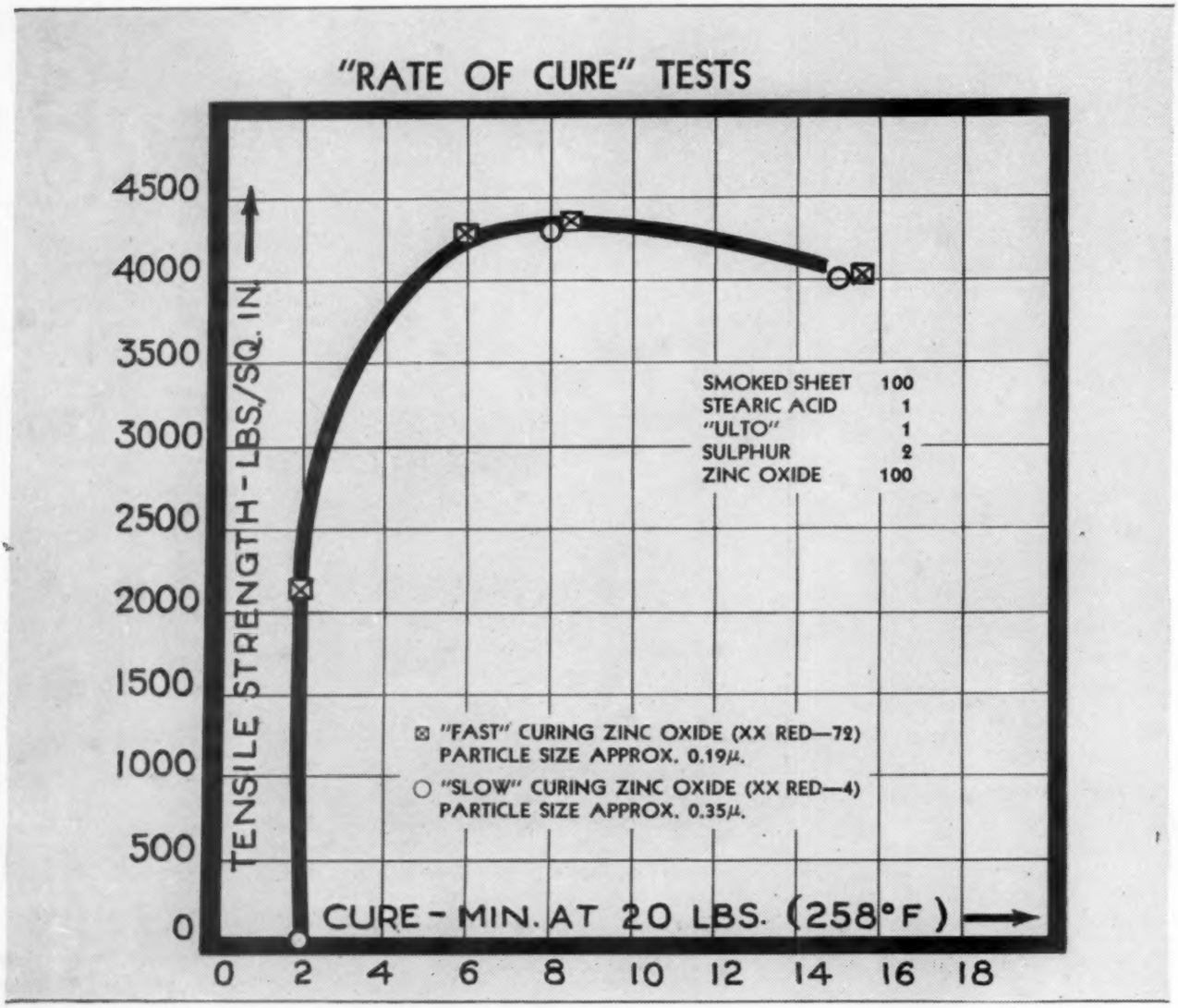

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THE RUBBER AGE

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Vol. 35 JULY, 1934 No. 4

Unsolved Problems of the Rubber Industry

By Dr. St. Reiner

Editor's Note—The article appearing below is a translation published in the *India Rubber Journal* (June 2, 1934) of a paper which originally appeared in *Kautschuk* (March, 1934). It is reproduced here not only for its value in calling attention to what Dr. Reiner considers some of the more important unsolved problems of the rubber industry, but also so that comments on it may be made by any American rubber technologists who may not agree that all of the problems in question have not been already completely or partially solved. A few of these comments, by both American and European technologists, follow Dr. Reiner's article.

IN AN interesting lecture before the Greater Hamburg local section of the Deutsche Kautschuk-Gesellschaft, Werner Esch discussed in a very clear manner the fifteen great discoveries made since 1898. This account is very valuable if only because in the hurry of everyday business life one seldom stops to consider whether some newly introduced raw material, accelerator, or antiager represents an outstanding discovery. These products of technical development are introduced into the factory, but with little thought as to their historical significance. It is the task of the historian to appraise correctly the significance of a successful discovery.

While the fifteen discoveries enumerated by Esch have, so to speak, become the common property of the industry, it will be granted that the following fifteen *unsolved* problems, some of which appear at present as insoluble and others as fantastic and "utopian," do provide an indication that rubber scientists and technologists have not yet reached their goal by a long way, and have still a large amount of development work to carry out.

Every advance should mean simplification of working conditions, lessening of production costs, and improvement of the finished product. Anyone who considers critically the production of a simple molded article cannot fail to be struck by the complicated and cumbrous nature of the whole process. In other words, our industry is in many respects complicated, clumsy, and wasteful of time. The goal is simplicity, suitability, and cheapness.

It is proposed now to consider systematically the fifteen problems in order of the individual manufacturing processes.

Latex Problems

1. *Impregnation with Latex*—The desire to make everything from latex is everywhere strong. Almost every rubber goods factory now uses latex or its concentrates, Jatex and Revertex, because its use means not only a very considerable simplification and improvement in quality, but often cheapening of the product. It is well known that latex is being used in increasing quantities in fabric spreading shops, impregnating plant, cord manufacture, etc. It has not yet become possible, however, to impregnate these textile materials through and through with latex, but only to cover or coat them with it (see E. A. Hauser and M. Hunemorder, *I.R.I. Trans.*, Vol. 8; *Rubber Chem. & Tech.*, Vol. 5). Strictly speaking, therefore, we are concerned not with an "impregnated" but merely a rubber-coated material. Whether the view that a textile material does not need to be truly "impregnated" would lessen the importance of the problem is another question, which only furnishes a temporary way out but not a solution of the difficulty. Many suggestions have been made for causing the latex particles to swell so as to facilitate penetration into the fibre, but the final result is after all only a surface coating.

2. *Vulcanization of Latex*—Some years ago a vulcanized latex product was put on the market and was claimed to constitute an important simplification in manufacture, especially for dipped goods. This product, however, soon disappeared again for various well-known reasons. By the use of ultra-accelerators vulcanization can be carried out just as quickly as with already vulcanized latex. This vulcanized latex contains at the most only 3% of combined sulphur, and it has not yet been possible to vulcanize latex with more than 30% of (combined) sulphur. The production, for instance, of hard rubber from vulcanized latex with about 50% combined sulphur is thus a problem that still awaits solution.

3. *Latex as a Protection against Rust*—As a competitor of the various anti-rust paints, latex is at present used only in isolated cases. If it were possible to vulcanize latex to about 50% combined sulphur content, such a product could be sprayed or painted *in situ* on metal parts or iron plate of any size without the need of subsequent vulcanization.

The prospects for the use of latex as a rust preventive would be very favorable in every way. In particular, a hard rubber latex paint would be incomparably more durable than any other (ordinary) paint, because latex hard rubber is highly resistant to acids and alkalis (also better than chlorinated rubber).

4. *Use of Latex in Cable Manufacture*—While latex is used almost constantly for the most varied purposes in the manufacture of soft and hard rubber, its use in the cable industry is attended with considerable difficulties. The deposition of latex on wire by the cataphoretic (anode) process is well known, and no longer presents any problem. It has been found, however, that the electrical properties of the resulting rubber covering are very poor. Within 24 hours the insulation drops by 30-40% and in the course of a week becomes practically zero. The cause of the decay in insulation resistance lies mainly in the occluded electrolytes, proteins, and pores, which subsequently take up water. The production of electrical insulations from latex is thus still an unsolved problem.

Soft Rubber Problems

5. *Preparation of Stocks*—When one considers the cumbrousness of a mill mixing plant the thought arises involuntarily that something should be done to eliminate this defect by suitable means. To prepare a satisfactory mixed stock from raw rubber it has to be kneaded, milled, plasticized, etc. The incorporation of the various ingredients, moreover, certainly does not add to the amenities of the mill room. There are now, of course, large (internal) mixers which carry out a good deal of this work, but we know that this masticating and milling is only effected with a very considerable expenditure of energy, so that the mechanical properties of the product suffer seriously as a result of the marked loss of "nerve" of the raw rubber (compare latex rubber). There is also to be considered the problem of making mixed stocks. A layman seeing a rubber mill room would suggest that the rubber should "somehow" be pulverized, the powder mixed with the other powdery ingredients, and the articles molded from the mixture just as synthetic resin articles are made. This idea, even though at first it appears fantastic to us, is entirely good, only the question of pulverizing the rubber is at present an unsolved problem from the practical standpoint.

6. *Multiplicity of Mixings*—Some reference should be made in this connection to the multiplicity of mixings, a question that has assumed very considerable proportions, especially in large works. It is not an exaggeration to speak of hundreds of formulae that have to be made up regularly. Whether there is any justification for their existence is a question that need not be discussed here.

The following plan occurs to the writer:—Preparation, to start with, of "active" mixings only; that is, only of such as contain active fillers alone, and not inactive fillers like whiting, talc, etc. These "active" mixings would be made with as little accessory materials as possible. The hardness, or toughness, or other properties could then be very exactly adjusted by suitable variations of the active fillers and accelerators or the sulphur ratio. As fillers rubber-soluble materials would mainly come into consideration, which would fulfill similar functions to the constituents of a metal alloy.

7. *Age-Resistant Soft Rubber*—The question of the aging of soft rubber is not yet completely solved by the use of the various anti-agers. Indeed, the problem would not be solved solely by the use of these materials even if there were really an anti-ager which practically, and not only theoretically, prevented addition of oxygen or similar aging changes. The problem is related on the one hand to the vulcanization optimum, and on the other to the sulphur ratio, as well as to the previous history of the rubber hydrocarbon. In the past, by the use of high sulphur ratios and prolonged vulcanization, better aging was obtained than with the present-day excessive acceleration, if by "aging" we understand not the quantitatively expressed fall in properties during aging, but rather the durability of the product. Under-vulcanization is more dangerous than over-vulcanization, because the former leads in a short time to the development of tackiness.

Some ways and means must be found for protecting rubber against the action of light and heat; in other words, some means by which it will be possible to make rubber products having as stable properties as the V-2-A steels, for instance; a kind of rubber alloy in fact!

Heat resistance and age resistance are identical concepts; to these must be added resistance to metallic poisons, which is likewise a very important problem because it involves big financial considerations. One need only remember, in this connection, electrical copper cables which have to be coated with tin to protect the rubber from the copper. The question naturally arises, is copper really very harmful towards vulcanized rubber? This question might be answered by bringing the degree of harmfulness of copper into relation with under-vulcanization, rather than with raw rubber or uncured stock. The simultaneous presence of stearic acid or other fatty acids markedly promotes the destruction of the rubber by copper or manganese poisoning.

8. *Oil-Resistant Soft Rubber*—This problem is likewise one of the most important in the rubber industry. Many suggestions, formulae, compromises, and so on, have been made in order to obtain a really oil-resistant rubber, but it must be realized that an absolutely oil-resistant rubber does not yet exist. It is in the nature of rubber to be non-resistant to oil. Yet the demand for an oil-resistant rubber is very great, so that it is the duty of the rubber chemist to tackle this problem not only by way of compounding, but rather from the colloid-chemical standpoint, since swelling is one of the most important properties of rubber.

Hard Rubber Problems

9. *Time of Cure of Hard Rubber*—It is well known that the saturation of the double bonds of rubber by addition of 50% of sulphur requires a very considerable time. By hard rubber we mean not heavily loaded qualities, but a product consisting of rubber and sulphur only. It is not yet possible to vulcanize such a material completely inside an hour. With increase in the wall thickness of the article the time of cure increases also; although the initial period of vulcanization can be shortened by certain accelerators, it is usually a matter of very long curing times amounting to 10-20 hours and more.

Much work still remains to be done in this field to eliminate the "cumbrousness" already referred to, or to make it possible to produce articles equal to synthetic resin products.

10. *Hard Rubber Resistant to Carbon Disulphide*—This may be regarded as quite an important problem. Not only hard rubber but many other organic materials, varnishes, etc., are not resistant to carbon disulphide. As, however, many tanks and pieces of apparatus are lined or covered with soft or hard rubber and may come in contact with carbon disulphide, among other things, the necessity arises for making a vulcanized rubber resistant to carbon disulphide. This problem again cannot be solved by compounding, but will have to be solved by colloid-chemical means. It is a question of the "loosening" of the structure of the vulcanized rubber by carbon disulphide—a kind of "etching" in the metallographic sense. The task of making hard and soft rubber resistant to carbon disulphide, although perhaps not a pressing problem, is nevertheless important and interesting in many respects.

11. *Heat-Resistant Hard Rubber*—Hard rubber will only withstand temperatures up to 135° C. at the highest. Above this it deforms and softens. Consequently if it has to compete with synthetic resin products the latter will certainly win. Yet hard rubber possesses especially good electrical properties, and should therefore hold a position of monopoly in electrotechnics. Owing to its poor resistance to heat, however, this is not the case. Some kind of polymerization or condensation, as in synthetic resin manufacture, suggests itself.

12. *Molding of Hard Rubber Dust*—Closely connected with the foregoing problem is that of the rapid molding of hard rubber. There are so called "dust moldings," but these have the disadvantage that they cannot be taken out of the press hot. It is always necessary to wait a long time until the moldings have cooled down so far that they can be taken out of the molds without danger of deformation. It ought to be possible, however, to find a way of molding ebonite dust exactly like bakelite, for instance, but considering at the same time the problem discussed under 11. Some kind of hardening or condensing agent must be discovered.

13. *Transparent and White Hard Rubber*—Both are as yet unknown. A kind of transparent hard rubber was made from synthetic rubber during the war, but this was rather a reddish translucent material which, as the thickness of the sheet was increased, became more and more opaque. It might be asked in connection with this problem, is the demand for transparent and white hard rubber so great that the problem must be solved? To this it may be answered that the progress of the synthetic resins and similar plastics has seriously reduced the market for hard rubber. It therefore falls within the scope of the rubber chemist to concern himself with the problem of transparent and white hard rubber.

Various Problems

14. *Substitute for Sulphur*—Many of the minor problems of rubber technology could be solved if it were possible to find a suitable substitute for sulphur. The suggestions put forward by Ostromysslenskii are, of course, quite well known, so that it is not necessary to go into them here. It is certain, however, that the problems of age-resistance in soft rubber, resistance to oils and to heat, resistance to carbon disulphide, transparent and white hard rubber, etc., could be solved if, instead of vulcanizing with sulphur, the rubber could be condensed, polymerized, or in some other way "stabilized." It is a sign of poverty of invention that during some 100 years no practically useful "stabilizing agent" other than sulphur has been found.

15. *Synthesis*—In conclusion, reference may be made to one of the most important problems. There are, it is true, already quite a number of good synthetic rubber products, but still no material that has gained practical importance (except perhaps the American chloroprene).

In times of economic reconstruction especially it is very important to use as far as possible products of domestic origin. It does not matter much if at first these products are rather more expensive than natural raw materials, because as a result of constantly increasing consumption the cost of manufacture of the synthetic products can be reduced. The author considers, however, that the basis principle of setting out to produce a "true-to-nature" rubber is to some extent false. An attempt is first made to elucidate the constitution of natural rubber, in order later to imitate nature. From a scientific point of view it is in itself very valuable to know how natural rubber is constituted, but this does not put us in the position of being able to produce technically a really usable rubber by synthesis.

In concluding, it may be noted that the problems enumerated above have arisen in technical practice, and that they form only a small proportion of the many and varied problems with which one might continue *ad lib.*

Comments in Foreign Press

FOLLOWING the publication of Dr. Reiner's paper in the **India Rubber Journal,** on June 2, some comments by readers were published in the issues of June 9 and June 16. In the former, E. S. Ali-Cohen, discussing the Use of Latex in Cable Manufacture stated that Homogeneous Cables, Ltd., of The Hague, a few years ago made several cables perfectly insulated with latex compounds. "For instance," said Mr. Ali-Cohen, "I remember a large length of high tension 4-core cable which was to serve a large dredger. The cable had to be laid down into seawater, and for a part in the open air. This cable was made for a working tension of 3,000 volts, but was found to withstand 70,000 volts. The samples kept for reference to-day do not show any alteration in the insulation. The insulation material manufactured later was much better, and research is still going on. Tests of electrical resistance of 350 K.V./cM. are now no exception. If properly made and applied there cannot be any question of decay in the insulation of the cable." In regard to Pulverized Rubber, Mr. Ali-Cohen stated that he had made pulverized rubber for a number of years and that it is manufactured in all degrees of fineness.

(In England powdered rubber has been used by the Reliance Rubber Co., Ltd., and probably others, in the manufacture of various beautifully finished rubber products which are said to be saleable commercially. Fordyce Jones, Managing Director of the Reliance Company stated recently that "an order has already been offered for the first ten tons of rubber powder which reaches the country."—Editor.)

In June 16 issue, Joseph Branwood of Southport, England, stated he and several associates control a process for the true impregnation of yarn by latex in a simple manner. Mr. Brantwood stated further, "We do not claim that the latex penetrates the wall of the fibre (cotton) and enters the lumen, but we do claim and can readily prove that each individual fibre of the yarn has a complete coating of rubber which is bonded to the fibre and cannot readily be stripped from it. In proof of this we are able to obtain, by independent tests, an increase in tensile strength of 25%, using uncompounded latex, and without subsequent vulcanization. There is no surplus rubber on the exterior of the yarns, the impregnated thread is smaller in diameter after impregnation than before, the thread is not sticky and weaves as well as the unimpregnated yarn. The resistance of the yarn to breaking down through internal friction on prolonged flexure is remarkable, as is its ability to bond to molded rubber. After extensive tests a well-known firm of woven belt manufacturers in this country has purchased the world rights for the process for conveyor and transmission belts."

Comments by American Rubber Technologists

Copies of Dr. Reiner's paper were sent to a number of American rubber technologists for their comments and several received up to the time of going to press are printed below. Others will appear in the next issue. In the meantime, comments from other readers will be welcomed for publication.

E. R. BRIDGWATER
E. I. du Pont de Nemours & Co., Wilmington, Del.

PERIODIC self-analysis is most helpful to any individual, corporation, industry or State. It serves the purpose of showing our energies are being directed in the most profitable channels or dissipated along by-paths that will not lead to our true goal. Dr. St. Reiner has performed a valuable service to the rubber industry by the publication of his paper in which he points out some of our unsolved problems. The writer, however, believes that a number of the problems he listed are more nearly solved than might be inferred from his resume and that he has omitted mention of several important and pressing problems while giving space to other relatively unimportant ones.

Impregnation With Latex

The impregnation of textiles and other fibrous materials with latex has been greatly improved through the use of the newly developed wetting agents, especially the sulfate esters of the higher fatty alcohols. True, it is not possible to cause latex particles to enter into the smallest space between the fibers of a woven fabric or tire cord. Presumably, it will never be possible to force a latex particle into a hole that is smaller than the particle itself. Complete impregnation of fibrous materials with latex requires not so much improved technique of impregnation as a latex having particles of smaller size, and that obviously must be a synthetic latex. DuPrene Latex has the desired small particles but further development work is required to perfect processes of impregnating materials with it.

Vulcanized Latex

Whatever may be the situation abroad, pre-vulcanized latex is being used in the United States in a very large and steadily increasing volume, which indicates that it must have greater technical and manufacturing advantages than Dr. St. Reiner believes it to have. Likewise, the problems involved in the use of latex for wire insulation have been largely though perhaps not completely solved. At least two important American manufacturers are making latex-insulated wire for a large variety of purposes. The electrical properties are in a number of respects equal and in some respects superior to the properties of wire insulated with dry rubber compounds.

Powdered Rubber

Dr. St. Reiner refers to the possible advantages to be gained from the use of powdered rubber if such a product were available. Presumably he is not familiar with the process invented by Dr. Stam in Holland, who produces powdered rubber with the aid of Dextrine. However, aside from the possible disadvantages of Dextrine in rubber compounds there remains the difficulty of properly dispersing vulcanizing agents, pigments, etc., in any powdered rubber. Many rubber technologists believe that the high viscosity of unvulcanized rubber is more fortunate than unfortunate because it is that property of rubber that makes it possible to disperse powders in it uniformly. The writer believes that a more realistic approach to the problems of milling and processing is to attempt to find materials that when added to latex or to dry rubber will reduce its state of aggregation and, consequently, its viscosity or toughness to the minimum figure that is consistent with good pigment dispersion.

Antioxidants

The industry unquestionably needs better antioxidants than are now available and, as Dr. St. Reiner indicates, this problem may be solved either through the development of new antioxidants or through the development of accelerators and vulcanizing agents that produce an inherently better aging product. There is a particularly pressing need for means of compounding rubber to make it more resistant to flex-cracking and to high temperatures than is now possible.

Oil-Resistant Soft Rubber

It appears from Dr. St. Reiner's comments on the need for oil-resistant soft rubber that he believes a rubber compound must not swell at all in oils if it is to be called oil resistant. However, the unsuitability of ordinary soft rubber compounds in service conditions that involve exposure to oil is generally due not to the fact that it increases in volume but to the fact that it suffers a serious loss in strength and toughness. Rubber compounded with sulfur-bearing thiuram accelerators, without added sulfur, still swells badly in oils but retains a much greater proportion of its initial strength and toughness than do ordinary high sulfur compounds. The synthetic rubber, DuPrene, also swells to some extent in oils although much less than any natural rubber compound but the important feature that entitles it to be called oil-resistant is that it retains its strength and toughness to such an extent as to be entirely satisfactory for most purposes involving oil exposure. It seems obvious that the problem of oil resistance may be considered solved whenever a compound is developed (for use in connection with a product designed for a specific service) that will remain in serviceable condition when exposed to oil throughout the normal life of the product. If this condition holds true it is usually possible to design the product in such a manner as to compensate for any increase in volume that the compound may undergo.

Hard Rubber

Dr. St. Reiner's comments on hard rubber are most interesting. Certainly, if a heat resistant hard rubber could be developed the market for hard rubber would be greatly expanded and its market would also be expanded to a slight degree if it could be made to resist carbon bisulfide. It is true that organic accelerators in general are less valuable in hard rubber than in soft rubber compounds but it is also true that some organic accelerators, especially those of the aldehydeamine type, do greatly decrease the time required for the vulcanization of hard rubber, and have made it possible to cure hard rubber products of the highest quality in 3 to 5 hours as against 10 to 20 hours mentioned by Dr. St. Reiner. In cheap hard rubber compounds such as are used for battery boxes and covers, even greater advances have been made. The time for cure in today's commercial practice ranges from 12 to 20 minutes. It may be objected, of course, that these are not true hard rubber compounds.

White hard rubber is still unknown and, as stated by Dr. St. Reiner, probably will remain unknown until a substitute for sulfur is developed. However, it is possible to produce a very light colored product through the use of thiuram accelerators and somewhat less than the theoretical percentage of sulfur. These products can hardly be described as true hard rubber but are sufficiently hard for many of the purposes for which hard rubber is used. By the addition of titanium dioxide to such base mixings, very light cream colored shades of hard rubber can be produced and with the use of organic colors it is possible to obtain bright colored "hard rubber" products in almost any shade that may be desired.

Synthetic Rubber

Dr. St. Reiner has drawn attention to the significance of synthetic rubbers from the point of view of national economy but neglected to mention that any or all of the problems referred to earlier in his discussion may perhaps be solved by the development of synthetic rubbers having the desired properties, rather than by treating natural rubber in such a way as to develop desirable properties and submerge undesirable ones. DuPrene, the synthetic rubber derived from chloroprene, is an example of what may be accomplished along such lines. Its commercial success is due wholly to the fact that by virtue of its unusual properties it is possible to achieve results with DuPrene that cannot be achieved with natural rubber. It is by no means improbable that other synthetic rubbers may be developed having still different combinations of properties which will consequently be better adapted to certain uses than either the natural rubber or DuPrene. Consider, for example, the persistent efforts that have been made through the years to develop rubber compounds that would not be subject to sun-checking or corona-cracking, a problem that has now been solved, not by modifying natural rubber, but by the invention of chloroprene rubber.

Likewise, DuPrene is inherently better aging, more resistant to flex-cracking and has greater heat-resistance than natural rubber. Other synthetic rubbers may be found in the future that will make heat-resistant hard rubber a reality or that will have only a fraction of the hysteresis loss of natural rubber and will be capable of being vulcanized to steel so as to adhere firmly even at temperatures upwards of 100°C., thus promoting the use of rubber in shear as a vibration absorbing medium. Such problems as these may perhaps be solved by developing new processes of treating rubber and new compounding ingredients, but is it not more likely that they will ultimately be solved by developing new synthetic rubbers that inherently possess the desired properties?

The writer has made no effort to comment on all the statements in Dr. St. Reiner's article with which he cannot agree,

(Continued on page 180)

RUBBER—Its Use in Conveying Equipment

By C. W. Geiger

THE world's most modern salt harvesting devices have revolutionized the harvesting of salt. By means of this new equipment the Aliso Salt Company, near San Francisco, take salt off their 1,500-acre salt farm that permit four men to harvest 65 tons of salt per hour. It has eliminated both hand and horse labor, which was used in all such salt harvesting plants before the use of this present equipment.

Hard salt, deposited by evaporation, is dug up by a 240-tooth rotary digger mounted on a "Caterpillar" tractor equipped with specially built four-foot-wide tracks. This digger travels back and forth across the salt beds paralleled with four sections of portable rubber belt conveyors totaling 800 feet in length, discharging the salt on to the rubber belts which convey the salt to a 100-ton barge, also equipped with rubber belt conveyors, operating on a canal which runs around the outer rim of the salt fields. This barge is moved ahead by a tractor as the salt digging progresses and when the barge is loaded the tractor tows it to the salt cleaning plant, where the barge elevating and conveying equipment discharges the salt into an overhead bin. As the salt from the 800-foot portable conveyors is discharged on to the conveyors on the barge, the barge conveyors in turn distribute the salt into the storage hoppers of the barge.

All conveying equipment, both on the barge and the four portable conveyors, are operated by electric motors, current for which is supplied by means of a transformer and a spool of cable, mounted on runners. From the spool the electric cables are extended to the electric motors on the four conveyors and the barge. As the conveyor system and barge are moved forward the transformers and spool of cable are moved forward on the runners by means of the tractor.

Each of the four portable rubber belt conveyors are mounted on two caterpillar type tracks and are easily moved and manipulated by the tractor. The salt at this $1,500,000 salt farm is obtained by evaporating the Pacific Ocean water by the sun.

In San Francisco the United Parcel Service Company has in operation an unusually efficient system of sorting bins, plus an electrical package conveyor and a fleet of pick-up trucks, which are used in handling the delivery of merchandise for several of the largest department stores in San Francisco.

Rubber Belt Conveyor for Packages

Packages carried forward by the slow-moving belt are picked off at central points, distributed in tiers, then loaded on delivery trucks.

To facilitate the quick loading of the pick-up cars at the retail stores, and to facilitate the quick unloading at the central delivery plant, special containers built of heavy wire screen are used. Each of these containers is mounted on casters, which enables them to be easily wheeled from place to place. The packages at the stores are placed in these containers and when the pick-up car arrives, the loaded container is quickly wheeled into it.

On arrival at the central delivery plant the cage filled with packages for delivery is wheeled over to the side of an electrically operated, slow moving rubber belt conveyor approximately 172 feet in length. The packages are then taken from the container and placed on the slow-moving belt. As the packages are carried along on the belt, checkers mark the packages for sorting, and they proceed on their journey to their respective bins, where they are removed from the belt and distributed to their respective compartments indicated by their markings. From these compartments the truck driver loads his delivery truck.

Belt System in Operation

A rotary digger, attached to a moving tractor, breaks up salt dried by the sun, throwing it onto an endless rubber belt which in turn throws it upon a long rubber carrier belt (seen in illustration) which carries the salt direct to waiting barges ready for the cleaning plant operation.

Constructing Automatic Stratostat

UNDER the direction of Professor Molchanov, ten balloons, or stratostats, for use in exploring the stratosphere, are nearing completion at the "Promtechnika" works in Leningrad, Russia. Each balloon consists of several spheres, 2 meters in diameter each, and gondolas. The spheres, which are made of rubber, will, in rising to the rarified layers of the atmosphere, be stretched and have permanent lifting power up to the time that they burst. This makes it possible for them to rise to a height of 40 kilometers.

One suggested improvement in the building of these flying ships calls for the construction of a stratostat with a "flying chair." The operator would be dressed in a special outfit made of thick, heavy rubber, resembling a diving costume. Special instruments would make it possible for the operator to detach the chair fro mthe balloon, if necessary, and descend by means of a parachute. A group of scientists in the Soviet Union is now investigating the type of cloth to be used in such a suit.

The illustration above shows a test inflation on one of the stratostats soon to be put into active service in the attempt to learn more about the workings of the upper air.

Latex Marketed in Powdered Form

INCREASING interest is shown by British manufacturers in the potentialities of a new process for converting rubber latex into a dry granular powder form instead of into sheet and crepe. The latex, as it arrives from the plantation, is stored in containers, from which it is drawn in pipes to nozzles, through which it is forced by air pressure, giving a spray which may be adjusted to the required particle size of the drops. The latter fall upon an endless stainless steel conveyor band, which then carries the rubber through drying chambers, and returns adhering to the under-surface of the stainless steel band, until it comes to rollers which rub off the powdered rubber. It then falls into a hopper, from which it is packed in cases ready for shipment. The dry rubber at this stage resembles fine sawdust in appearance, or what is usually known in the rubber trade as "fine crumb."

A considerable saving in time and in materials is gained by the dry rubber process, it is claimed. World rights to the invention, owned by Dutch interests, have been acquired by an English concern, the Rubber Powder Company, and the undertaking has an authorized and issued capital of £30,000.

The liquid latex is mechanically converted into fine dry powder in a much shorter space of time than is involved in the preparation of sheet and crepe. It is also claimed that this new process eliminates the costly smoking accommodation, machinery, factory space and drying lofts used in producing sheet and crepe.

The product also offers important advantages to the manufacturers. It is claimed that the rubber would be available in a standardized form, with all the advantages of the full serum content; that it would not have been injured by acids in coagulation; that it would be absolutely clean, easily handled, safe in storage, and easily mixed with compounding ingredients; that it would eliminate the tedious process of heavy mastication necessary in breaking down the sheet rubber, and that it could be used economically for any known process.

Favorable reports on the product are said to have been given by A. Van Rossem, head of the Netherlands Government Rubber Institute, by P. Schidrowitz and by Fordyce Jones of the Reliance Rubber Company.

The machine for preparing the rubber will be leased to producers in consideration of a royalty based on the quantity of rubber powder produced. The company may also assist producers in marketing the product.

Super Floss—A Reinforcing Pigment

UNDER the name of Super Floss, a new reinforcing pigment is being introduced to the rubber industry by Wilfrid Smith, Ltd., 37 Great Tower Street, London, E. C. 3, England. It consists of processed amorphous distomaceous silica prepared to an accurate degree of fineness and uniformity. It has a specific gravity of 2.05 and an apparent density of .8 lbs. per cubic foot. Snow white in color, it is separated by a special air process which is said to insure absolute immunity from any grit and it will practically all pass through a 325-mesh sieve.

Super Floss can be used with all accelerators, according to the manufacturer, and the percentage of sulfur is not affected by any quantity that may be added to the compound. High volume loading of Super Floss can be effectively dispersed in a rubber compound, and it is particularly recommended for reclaimed stocks.

Arrow Compact—A Dustless Black

PRODUCTION of a new dustless and free flowing carbon black under the trade name of Arrow Compact is announced by J. M. Huber, Inc., 460 West 34th Street, New York City. A unique mechanical treatment is said to yield a thoroughly blended product. The particles are agglomerated into tiny granules that do not fly about in handling, but break down readily into the natural fineness upon mixing with rubber. It may be compounded interchangeably with ordinary black inasmuch as none of the inherent reenforcing properties are altered in any way.

Rubber Restriction Plan Enters Second Month

International Authorities Comment on Various Phases of the Scheme in Relation to Results

NOW that the second restriction plan is in its second month it is interesting to note the reaction that has set in as asserted by rubber authorities throughout the world. Officially, the restriction plan, signed by practically every important or semi-important rubber producing country in both hemispheres, went into effect on June 1. It will be given a five-year trial ending December 31, 1938, although an appointed International Rubber Regulation Committee, consisting of delegates named by the respective nations concerned, will present a program for continuance or discontinuance prior to that date.

F. R. Henderson, whose experience in the American rubber field has the background of a long series of years, declares that with the legal adoption of the restriction scheme by all participating territories, the current year will probably stand out as a landmark in the history of the rubber growing industry. There is every reason to believe, according to Mr. Henderson, that the present attempt to control crude rubber output will be crowned with success. He lists nine specific points as the basis for this statement, as follows:

Specific Points Cited

1. Its object is to achieve and maintain such a price level as will make the production of rubber a profitable enterprise.
2. It is applied to an international commodity of great importance.
3. It is inclusive enough to eliminate production of rubber outside of the restricted area.
4. It commands a general measure of assent among the producing countries and a substantial majority of the producers within each territory.
5. It is mindful of the interests of the consuming elements, which is equally concerned with producers in the maintenance of regular supplies at fair and relatively stable prices.
6. It is administratively well designed and practical, and the individual governments concerned have the power and will to enforce it in their respective territories.
7. It is of sufficiently adequate duration to give assurance to all concerned that its object can be successfully achieved.
8. It is flexible enough to permit alterations in its provisions to meet the changing conditions.
9. It is very similar to tin and tea restriction schemes, where an organized system of production control has brought the output of these two commodities into reasonable relation with the current requirements, with the result that the price has rapidly adjusted itself to the economic level.

A fair and equitable price for the producers which is the object of the scheme, continues Mr. Henderson, must be such as to cover cost of production and leave a profit in proportion to the hazardous character of the rubber growing business. There are many factors which the International Rubber Regulation Committee will have to consider in its efforts to attain and maintain an economic price level for crude rubber. For instance, the cost of production increases when output is restricted because with a reduced crop, the allocation of overhead charges must and will result in higher outlays per pound of commodity.

Expenditures Will Rise

Costs prevailing during the depression years can hardly be taken as a criterion of normal cost. With the return of better times, there is bound to be an increase in actual expenditures on the part of the producer, owing to higher salaries and wages, which have been cut to the bone during the period of depressed prices. There is also a host of arrears of upkeep work to be done and this is likely to affect the current costs of production on plantations. Furthermore, normal allowances for depreciation and obsolescence, which, as a rule, have not been made during the depression, will be restored as soon as the price of rubber will justify such action. Finally, during the last two or three years, the colonial governments have reduced the rents and in some cases taxes considerably and these are likely to be raised again.

Although we believe that during the first few months of restriction the scheme will be applied very gradually in order to prevent disturbances within the industry, we confidently look for substantially higher prices for crude rubber in the not too distant future.

An authority of finance, who signs himself as "W. W. R.," writing in *The Financial News*, London, points out the fact that the trade, now that the restriction plan has been introduced without mishap, is exceedingly quiet. Doubts have been raised, he claims, as to whether the current price of the commodity will successfully resist the depressing influence of the heavy quantities of rubber shortly to arrive from producing districts. He is not so sure that American consumption will be as large as heretofore because of labor problems now facing American rubber product manufacturers.

Native Grower Problem

Emphasis is being laid in some quarters on the intractability of the native grower in the Dutch East Indies, continues W. W. R., with the possibility of disrupting the plan laid at the door of this class of producer. On the sunny side of the fence this authority points out that the commodity price will probably wilt under the weight of abnormal supplies in the next few months, but the 30 per cent cut in English exports which begins to operate in December, 1934, will undoubtedly result in a steady amelioration of the industry's position and in the establishment of a better price than that of today's market.

H. Morison & Company, noted English brokerage house,

in its May-June monthly review of the industrial and rubber markets, comments on the confusion in regard to the working of the restriction scheme, which has induced rather pessimistic views as to the statistical position for the future. In an effort to clear up this confusion the review makes clear that though the actual restriction of the quota does not commence to operate until August, the maximum amount of rubber that may be expected from each signatory country has been already fixed for the year 1934, and for following years as well.

So far as the current year is concerned the quota started on June 1, and consequently a maximum of seven-twelfths of that quota only will be allowed to be exported from June to December. That maximum will be subject to a deduction, which will average 13 per cent over seven months. Although every available ounce of rubber will have been shipped from exporting countries, prior to June 1, the situation does not change because these shipments constitute a transfer of rubber stocks and it is immaterial where the stock is held.

The detailed working of the scheme is gradually coming into view, though it may yet be a considerable time before the quotas allowed to all estates are known and even then it is likely that in some cases there will be appeals against assessments. One estate, known to the Morison Brokerage, Sapong, reports that a provisional assessment of 400 pounds per acre on 2,300 acres, or 920,000 in a full year, has been given them. The effect on this company will be that they may produce 467,668 pounds in the last seven months of this year, or 66,809 pounds per month, as against 156,000 pounds produced in the first five months, or 31,200 pounds per month. This means that the estate is required to double its output if they are to work up to their exportable allowance.

Price Should be Maintained

W. J. Gallagher, retiring chairman of the Rubber Growers Association, of England, in a message to that association on the occasion of its annual meeting last month, stated that an increase in the price of crude rubber, brought about through the restriction scheme, which has not materialized to date, need not mean any substantial increase in the price of the majority of manufactured rubber goods either in England or in the United States. As an example, Mr. Gallagher referred to the cost of crude rubber in relationship to the total cost of all rubber articles other than tires. This cost is only 6 per cent. The cost of crude rubber is only aproximately 12 per cent of the selling price of tires in this country.

The price of crude rubber is not, according to the British authority, a preponderating factor in the selling price of most rubber goods, and, therefore, any price increase should not unfavorably affect the consumption of most rubber articles. With reference to competition from substitutes and from reclaimed rubber, Mr. Gallagher took the viewpoint that the industry should be prepared to accept both forms as, if and when they can hold their own with the crude product at economic prices. As for reclaimed rubber, restriction or no restriction in the crude rubber field, he declared it would be continued to be used even when crude rubber was at its economic price.

In concluding his address, the former chairman of the Rubber Growers Association claimed that there are two major duties before rubber producers of the world, one being to defend and maintain rubber in its present applications and prevent its being replaced, and, secondly, to increase the consumption in its present uses and to discover new uses wherever possible.

Wax Emulsions

THE use of Japan, Paraffin and Carnauba wax for preventing teckiness and increasing durability of finished rubber products is made more practical by the development of emulsions of these waxes by the Wilbur White Chemical Company, Oswego, N. Y. It is claimed, for instance, that a dilute Carnauba wax emulsion enhances the appearance of molded rubber articles, prevents oxidation and prolongs the life of the article. Special formulae have been developed for rubber gloves, hot water bags, bathing caps, tires and other products subject to oxidation.

Wax emulsions, in which water is the carrier, are being used in several industries at the present time due to many fundamental characteristics, which recommend them over waxes dissolved in solvents or applied in a melted form. The water emulsions of Japan, Paraffin and Carnauba waxes are said to be economical to use, due to their splendid covering power. The surface tension which can be controlled in the course of manufacture, and which, in many cases, is about half that of water, makes them applicable to many surfaces, which can not be thoroughly coated by water alone. The colloidal particles size of the emulsions can also be regulated and, when extremely small, certain Carnauba wax emulsions dry with a lustrous film. Japan and Carnauba emulsions, having small colloidal particle size, will thoroughly impregnate absorbent materials. Water wax emulsions can be applied to many surfaces and objects, where melted waxes or waxes dissolved in solvents cause trouble.

Compression Cutting Test for Rubber

A COMMON method of measuring the quality of a rubber product is to make tensile strength and stretch tests on specimens of the rubber used. For products such as rubber bands, these tests are closely related to actual service, but for many rubber products, such as insulated wire, hose, and tires, the tests have only an indirect bearing on the performance in service.

In an attempt to make a test which would approximate the conditions encountered in use by many rubber articles, and at the same time simplify testing, a compression cutting test was suggested by the Bureau of Standards. This test consists of compressing a sample of rubber to failure between a flat plate, or anvil, and a cutting tool and recording the relation between the thickness of the sample and the load up to failure. The Bureau of Standards has recently completed a detailed study of this test. The results are described in the April number of the *Journal of Research*, in which the conclusion is reached that the compression cutting test is valuable as a supplement rather than as a substitute for tensile strength and stretch tests.

New Russian Synthetic Rubber

OFFICIAL reports from Russia state that a group of scientific workers connected with the Institute of Applied Chemistry has developed a new synthetic rubber which has been given the designation "Sovpren." It is said that its quality is higher than that of other varieties of artificial rubber and that it is extremely simple and cheap to produce, being derived from a combination of lime, coal and salt. The Institute has already made several sample automobile covers from the new rubber, and the first tests indicate that they are strong and durable. The experimental plant connected with the Institute will start shortly on the production of the new material.

Rubber Groups Hold Outings Combined With Business

New York Group Competes for Prizes; Rhode Island Group Attends Meetings

New York Rubber Group

MEMBERS of the New York Group, Rubber Division, American Chemical Society, conducted an all-day outing on Saturday, June 30, at Semler's Midland Park, Grant City, Staten Island, N. Y. Fifty-eight members were present to participate in the event, which was the first of its type to be held under the auspices of the organization.

The day's program was crowded with activity from the time of the arrival of the first members shortly after 10 A. M. until the serving of dinner at 5:30 P. M. Golf enthusiasts had opportunity to join in that sport for attractive prizes, while others of the gathering were driven to Midland Beach to swim in the cool waters of the Lower Bay. The afternoon was featured by a soft baseball game, in which Neal Wilder's Wildcats lost to Ted Sullivan's Bears by a score of 8 to 6, with Sullivan contributing the only home run of the contest. Other games during the day included shuffle ball, quoits and horseshoe pitching.

The golf tournament, conducted at a nearby club, resulted in the following winners, to whom were awarded prizes of golf balls: Kickers Handicap, C. E. Barnett, 73; low net, 18 holes, H. B. McCreary, 70; most birdies, 18 holes, W. R. Ritz, 2; most threes, 18 holes, D. A. Shirk, 4; low gross, 18 holes, E. B. Curtis, 77.

Beer and frankfurters were served without cessation through the morning and afternoon and were followed by a complete shore dinner. Impromptu entertainment was furnished during the dinner by a passing hurdy-gurdy virtuoso, assisted by several members of the group. Each diner received two Ajax pocket combs as table favors through the courtesy of the Vulcanized Rubber Company.

General arrangements for the affair were under the supervision of Peter P. Murawski as chairman, Emil W.

(Continued on page 182)

TOP, left to right: Ted Sullivan's winning baseball team; scene on playing field; Neal Wilder's losing baseball team. CENTER, left to right: calling strikes, C. A. Bartle; Bruce Silver, secretary, keeping cool; the eats; "Butch" Hamister, the organ grinder; Harlan Depew, pitching horseshoes. BOTTOM, left to right: hot dogs and beer; the prizes; mystery scene, what are the boys doing?

Comments by American Technologists

(Continued from page 174)

but has touched only on the points on which he is especially interested. Some of Dr. St. Reiner's comments, such as those on the relationship of sulfur content to aging are so obviously at variance with American experience as to require no comments.

H. J. ELWELL
Vultex Chemical Co., Cambridge, Mass.

Vulcanized Latex

VULCANIZED latex as manufactured by the Vultex Chemical Company has for the past several years been enjoying a steady and healthy increase in volume. In fact, the company found it necessary to procure new quarters and treble its capacity early this year. Vultex is a recognized material that is rapidly increasing in usage in many fields, particularly the very field that Dr. St. Reiner mentions, namely—for the manufacture of dipped goods.

There are many good reasons for this growth. As contrasted to naphtha cement, Vultex requires no milling, saving the investment in equipment as well as power, labor, time and processing. It requires no solvents, thus eliminating all fire hazard and the toxic effects which are present where rubber cement is used. There is also a substantial saving in insurance. Higher concentrations of rubber per gallon permit of greater desposits per dip and consequently fewer dips per article.

As contrasted to other latex processes, the vulcanization operation on the finished article is entirely eliminated reducing the time the article is on the form and conversely increasing the production per form, and thus saving a substantial investment in forms. Prevulcanization also determines the quality of the cure before the article is made, and the elimination of the curing operation while the article is on the form makes it unnecessary to use forms made of special materials or with special finishes to withstand the curing process. Each article made from a batch of vulcanized latex has exactly the same cure as every other article. The uniformity of the cure in the finished product is not dependent upon the dispersion of the curing ingredients in the mixture or in the dried film.

When vulcanized latex is used for dipped goods, excesses of vulcanizing ingredients, beyond those actually required to obtain the optimum cure, may be removed while the rubber is still in liquid form and before the finished product is manufactured. This is important provided a stable finished article is required, for if these excesses were permitted to remain in the product, exposure to heat would change its physical characteristics. This question of control of excessive curing ingredients is also important in those products where a sulphur or accelerator bloom is undesirable.

The use of vulcanized latex reduces the manufacture of rubber articles to the simplest form.

Vulvanized latex has increased the outlet for ultra-accelerators because by the use of the Vultex process there is no danger of scorching on the mill nor of the jelling that is common to naphtha cement. Many latex users employing ultra-accelerators are following the teachings of Schidrowitz in patent No. 1,682,857.

Latex in Cable Manufacture

Dr. St. Reiner's article is also inaccurate in his comments on electrical resistance and the use of this type of material upon wire. Simplex Wire & Cable Company have for some time been marketing a substantial quantity of wire in which the insulator is Vultex, and I believe that the quality compares favorably with that of wire made by the old milled rubber process.

J. T. BLAKE
Simplex Wire & Cable Co., Cambridge, Mass.

IF DR. REINER'S article is an index of European rubber knowledge he would benefit materially from a trip to this country. Although one may span the distance between the two continents in under five days, technological information seems to travel much slower.

Vulcanized Latex

The comment is made that Vultex appeared on the market some years ago but disappeared for various well-known reasons. Not only is the Vultex Chemical Company a thriving firm of several years' standing but considering its comparative youth is expanding at a remarkably rapid rate.

Latex in Cable Manufacture

It is also claimed that the production of electrical insulation from latex is still an unsolved problem. The National India Rubber Co., is making insulated wire successfully from latex. The Simplex Wire & Cable Co., after several years of development produced in 1930, wires and cords manufactured with Vultex (which may be considered a form of latex). In 1931 their business was substantial and two years later had increased ten-fold—and this in a period of depression. The insulation has high resistance, high dielectric strength, and a low dielectric constant and these qualities deteriorate but little after months of soaking in water.

Age and Heat-Resistant Rubber

Dr. Reiner laments that the problem of long-lived and heat-resistant rubber has not yet been solved. The basis for the solution of the problem, the proper vulcanization of the rubber, was published in 1930 (Boggs and Blake I.E.C., 22, 1930). The practical results of their theory may be found in a subsequent publication (Vanderbilt News, 3, 2, 1933). Rubber compounds are regularly produced that deteriorate less than 20% in an aging test that is probably equivalent to 50 years of natural life, implying that their real life can be measured in centuries. Posterity and future museums seem to be fairly well provided for. The same type of compound is extraordinarily resistant to heat.

Oil and Solvent Resistant Rubber

Rubber may not have been made oil-and-solvent-resistant, but we have available commercially two rubber-like materials that are extremely valuable in this respect. DuPrene has 6 to 10 times the oil resistance of rubber and Thiokol is nearly perfect in this respect.

Hard Rubber

Dr. Reiner seems to be unaware that the softening temperature of hard rubber can be materially raised by the use of selenium.

Sulphur Substitutes

He is also pained "that it is a sign of poverty of invention that during some 100 years no practically useful 'stabilizing agent' other than sulfur has been found." In this country rubber is commonly vulcanized with sulfur-bearing accelerators, selenium tellurium and sulfides, and DuPrene is "stabilized" with heat alone as the agent.

Dr. Reiner bewails that rubber has not yet been made as "stable" as the V-2-A steels. May I also complain that we have so far failed to produce a rubber of 200,000 lbs. sq. inch tensile strength with a melting point of 2000°? Of course, the metallurgists have not evolved a steel with an elastic elongation of 1000%.

W. A. GIBBONS
Director of Development, U. S. Rubber Co.

Latex in Cable Manufacture

DR. ST. REINER is evidently unaware that wire insulated by means of latex is on the market and has been on the market for some time. Not only is the process satisfactory from the manufacturing standpoint, but an insulation of very superior quality can be obtained by this method. The U. S. Rubber Company, who produce wire insulated by the latex process, have given the trade name of "Laytex" to this product. Owing to the automatic centering of the conductor, the purity of the insulating composition and its laminated structure. Laytex wires have higher insulation resistance than the standard 30% insulation applied by the tuber process, as shown by the following results of tests:

Type of Insulation	*Immediate Resistance (Megohms per 1000')*	*Ins. Resistance After 24 Hrs. In Water (Megohms per 1000')*	*% Change*
Laytex Insulation	22,000	24,000	+5% (increase)
30% Insulation	5,400	4,200	20% (decrease)

It will be noted that not only is the immediate resistance of the Laytex far superior to the 30% insulation but that in this particular case the Laytex insulation actually improved in resistance after immersion in water for 24 hours. This improvement after immersion has been observed in numerous tests.

Society for Testing Materials Holds 37th Annual Convention

Paper on Proposed Method of Treating Adhesion of Rubber to Metal Introduced Though Not Scheduled

IN ADDITION to the annual report of Committee D-11 on rubber products, three technical papers on subjects of importance in the rubber industry, featured the eleventh session of the thirty-seventh annual meeting of the American Society for Testing Materials, held from June 25 to June 29 at the Chalfonte-Haddon Hall in Atlantic City, N. J.

O. M. Hayden, manager of Rubber Laboratory, E. I. du Pont de Nemours & Company, Inc., presented a paper on "The Testing of Rubber and Rubber-Like Materials for Oil Resistance." At present the oil resistance of rubber and rubber-like materials cannot be adequately evaluated from tests that are expressed numerically. The most significant changes that occur during immersion in oils affect such physical properties of the compound as flexibility, toughness, surface disintegration, and the like. As yet these changes are evaluated by superficial examination rather than by mechanical tests. Because these are the really important properties that determine the suitability of any given composition for use under any specified conditions of service, the testing engineer must develop observation and manual tests which will supplement machine tests; develop accelerated tests that can be correlated with service conditions; and study interpretation of test results in values which will demonstrate the performance of these products in oil or solvent service. It is of interest to note in this connection that an A.S.T.M. sub-committee headed by Mr. Hayden is now at work on these tests.

"The Testing of Raw Materials for Rubber Compounds" was discussed by B. S. Taylor, manager Raw Materials Inspection and Development, the B. F. Goodrich Company. The critical points to consider in evaluating a raw material for rubber are: (1) ease of incorporation into rubber batches; (2) effect on rate of vulcanization and aging; (3) ability to reinforce or soften rubber compounds; (4) effect in imparting special physical properties; (5) properties involving human factors—color, odor, toxicity, consistency. Mr. Taylor evaluated thoroughly the physical and chemical properties of zinc oxide and carbon black. He also described a number of important impurities, explaining why they are undesirable.

Rubber Litharge Compounds

Rubber compounds used in structural engineering models were discussed by A. V. Karpov, designing engineer, Aluminum Company of America. A rubber litharge compound seems the most satisfactory of present materials. Based on his studies, the author suggests that (1) fillers which during the curing enter in a definite chemical combination with the rubber are preferred; (2) since the Poisson's ratio of rubber is very close to 0.5, a compound of a low Poisson's ratio in all probability will contain fillers in large volumetrical proportions; (3) the main difficulty to be overcome lies in the discovery of a filler or fillers which will permit heavy loading of the compound without impairing its elastic qualities and without introducing pronounced plastic properties.

A. H. Flowers and H. E. Wening, of the Inland Manufacturing Company, Dayton, in a paper on the "Proposed Method of Treating Adhesion of Rubber to Metal," which was not submitted in time for inclusion in the printed program (see June issue of THE RUBBER AGE), but which was accepted because of its importance, described the method developed by them and indicated considerable data from their work. Results are expressed in pounds per square inch necessary to obtain separation of a cylinder of rubber from metal parts having two square inches area. Pull is at right angles to adhered surface. Results for the average pull in pounds per square inch ranged from 257 for auto running board mat stock to 1232 for engine mounting stock.

Test for Abrasion Resistance

Committee D-11 presented two new methods and one specification which were approved as A.S.T.M. tentative standards, as follows: Methods of test for abrasion resistance of rubber compounds; method of test for compression set of rubber used for vibration absorption; specifications for insulated wire and cable: Class A, 30 per cent Hevea rubber compound.

While no single abrasion test is entirely satisfactory, equipment for the six most widely used methods is commercially available. The committee is not in a position to recommend any one of the six for exclusive use, but recognizes that all six methods provide valuable technical information under certain conditions. It is felt, however, that standardization in this field of testing is needed and that a substantial part of the test procedure is common to all of the methods. The committee also believes that the procedure for conducting a test on each of the six available machines should be standardized even though it is not desirable to single out a particular machine for recommendation. Accordingly, a proposed composite method has been prepared in which standardization is carried so far as is practicable at the present time.

The second item listed above is believed by the committee to represent the best practice at present available and satisfactory as a reference and arbitration test.

Believing it desirable to separate the insulated wire specifications according to the type of insulating compound used, three individual standards are now provided, of which the tentative specifications for insulated wire and

cable, Class A, 30 per cent Hevea rubber compound is one. The tentative specifications for insulated wire and cable: 30 per cent Hevea rubber (D 27-33 T) will be revised to cover only the Class A0 compound, and the tentative specifications for insulated wire and cable: performance rubber compound (D353-33 T) will continue as at present.

The following two tentative standards were recommended for adoption as standard: Specifications for cotton rubber-lined fire hose for public and private fire department use (D 296-31T); and method of test for hardness of rubber (D 314-31 T).

In response to a quite general demand, a number of revisions were made in the specifications for friction tape for general use, including a new test for tackiness, revised methods of sampling and requirements for maximum length per roll.

Rubber Groups Hold Outings

(Continued from page 179)

Schwartz, W. M. Morse, with the aid of Carl Wright, Bruce Silver, T. N. Wilder, Peter P. Pinto and other members. An unusually attractive assortment of prizes, donated by companies and individuals in the industry, were awarded to the holders of the lucky ticket numbers immediately before the serving of dinner.

The donors of the prizes included E. I. du Pont de Nemours & Company, copper service set, golf balls, sport bag; Essex Rubber Company, play balls; General Atlas Carbon Company, golf balls; *India Rubber World*, croquet set, golf book, roulette wheel, rubber quoit set; Joseph A. McNulty, golf tees; Peter P. Murawski, "Applejack and Undies" in book form and in actual fact; Naugatuck Chemical Company, golf balls; New Jersey Zinc Company, electric clock; Parker Stearns Company, bathing cap, hot water bottle, magicians' bulbs, poop bag; Henry C. Pearson, shuffle ball set; Philadelphia Rubber Reclaiming Company, bill fold, steel quoit set; THE RUBBER AGE, flashlight; Rubber Service Laboratories, cocktail serving tray, cocktail shaker, rubber quoit set; Seamless Rubber Company, bathing suit, hot water bottle; United Carbon Company, desk set; United States Rubber Company, bathing suit set; Van-Sul, Inc., box of rubber bands, card table covers; Vulcanized Rubber Company, hard rubber trays, pocket combs.

Rhode Island Rubber Group

THE first annual outing and meeting of the recently formed Rhode Island Rubber Group was held June 21 at the Pawtucket Country Club, Pawtucket, R. I. In the afternoon approximately 40 members and guests participated in the Golf Tournament. This was followed in the evening by a dinner and technical meeting, attended by approximately 80.

Chairman Ernest Brown of the National India Rubber Company, Bristol, presided and presented David C. Scott of the Henry L. Scott Company, Providence, whose short humorous address was particularly well received.

Mr. G. E. Lang, of the U. S. Rubber Company, speaking on the topic of "Testing Golf Balls" traced the history of the various types of construction of golf balls for a period of years comparing them with the different types of modern golf balls manufactured today. He stated that the rubber thread tensions on the golf balls have a definite effect on the distance obtained from drives. He closed his remarks with a brief description of the driving machine used by his company in making a final test of golf balls to determine their driving quality and ability to stand up under playing conditions.

Through the courtesy of the U. S. Rubber Company a moving picture entitled "The Manufacture of Golf Balls" was also shown.

Winners in the golf tournament and the prizes received were as follows: First gross score, A. K. White—Traveling Bag. Second gross score: C. W. Fagan—Golf Bag. Third gross score, J. E. Dowling—Hot Water Bottle. Fourth gross score, E. M. Ruppert—Garden Hose. First net score, Robert Cowen—Traveling Bag. Second Net score, Charles Weller—Leather Key Case and Billfold. Third net score, J. Murray—Rubber Gauge. Fourth net score, Edwin Koth—Garden Hose. Fifth net score, K. Lazette—Six Golf Balls. Sixth net score, F. W. Snow, Jr.—Six Golf Balls. Seventh net score, Gib Madge—Six Golf Balls. Eighth net score, H. A. Schlosser—Cord Set.

Prizes were donated by the following companies: Traveling Bag, Appleton Rubber Co.; Golf Bag, L. G. Whitermore; Hot Water Bottle, Davol Rubber Company; Garden Hose, Atlantic Tubing Company; Traveling Bag, Dupont Company; Leather Key Case and Billfold, Rubber Service Laboratories Company; Golf Balls, Naugatuck Chemical Company; Electric Cord Set, Anaconda Wire & Cable Company; Rubber Gauge, Federal Products Company.

The committee of arrangements included, Chairman, F. E. Rupert, Anaconda Wire & Cable Company, D. C. Scott and Charles Berlow, American Wringer Company.

Akron Rubber Group

MORE than 200 members attended the annual summer outing held on June 22 at the Fairlawn Heights Golf Club, Akron. Out of this total 120 teed off in the golf tournament, which was the feature attraction of the day. The special golf prize was won by L. C. Peterson of the India Tire Company, and another prize trophy was awarded to A. S. Michelson, National Rubber Machinery Company, for placing a drive nearest the pin on the eighteenth hole, a three par hole.

No speakers were included in the program, which provided numerous outdoor and indoor festivities, in addition to the golf matches. Dinner was served at the Fairlawn Heights Club House in the evening. Prizes were awarded for the different sports indulged in and included golf balls, hose, tubes, etc. In all more than fifty companies contributed the varied prizes and practically every attending member received some token of his share in the day's festivities.

A New Artificial Leather

THE Russian city of Leningrad, reporting through its Institute of Chemical Technology, claims a new method for producing artificial leather. This involves the use of scrap leather and its interaction with rubber and various chemicals. The life of artificial sole leather made from this admixture is some 2 per cent longer than that of rubber soles. Mass production will be undertaken in the Bromtechnika plant, and another factory with an output of 3,000 tons a year is to be built in Moscow.

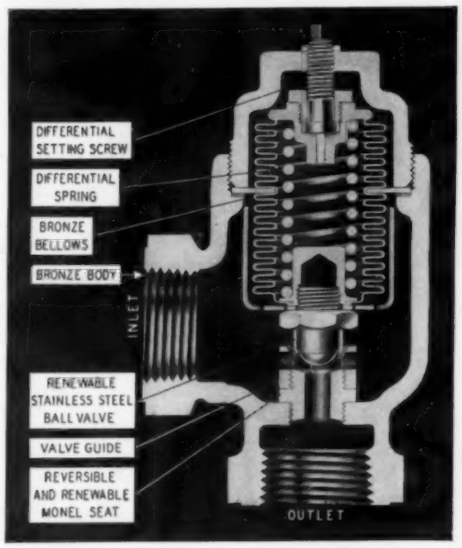
Latex Used in Lining Fur Coats

RUBBER latex is now being employed in connection with an inner lining for fur coats. The latex is applied as a fur back and then the silk lining is placed over it. It is claimed that this process not only increases the warmth of the coat but also strengthens the sewing of the different skins together. It is understood that this product is already on the market on quite a substantial scale.

New Equipment

TAG Steam Traps in Three Sizes

THE C. J. Tagliabue Manufacturing Company, Brooklyn, N. Y., has recently brought out a new and greatly improved thermostatic steam trap for industrial use. These traps are now offered in ½, ¾ and 1 inch sizes with greater capacity and far greater steam economy. By virtue of unique principles applied to design and construction, they will do the work of larger and more costly traps.



An exclusive differential setting feature, which proved successful on their original trap, has been retained and continues to assure actual saving of steam. An adjusting screw located at the top of the trap may be set to discharge condensate at a temperature corresponding to as much as 20 lbs. less than the operating steam pressure, whether it is 50, 75 or 125 lbs., without any further adjustment.

Other outstanding advantages are the renewable and reversible double life Monel seat, and a renewable stainless steel ball valve, the ball of which is true to within 0.00005 of an inch. As a further protection the renewable valve guide holds the ball valve central to the seat and thus insures tight closing.

Boiler for Experimental Process Work

A MOST interesting application of high pressure steam to process, where a sustained high temperature is essential, is to be found in a small 1,500-lb. pressure boiler that a large manufacturer in one of the process industries is now installing for experimental purposes.

The idea underlying the use of saturated steam at this pressure was its ability to supply heat at a constant delivered temperature of 575 F. to the particular process. Obviously, superheat and a lower steam pressure would not have provided a sustained temperature during process, for as heat was given up the superheat would drop. If the experiments with steam from this miniature boiler work out satisfactorily it is contemplated to install a ful size unit to supply steam at this pressure for regular production. There are undoubtedly processes in other industries wherein this principle could be applied to advantage.

The experimental unit, built by Combustion Engineering Company, consists of a single row of tubes entering top and bottom headers which are connected by a single downcomer. The tubes are 1 in. outside diameter and the headers of forged steel, rectangular in section, placed 7 ft. 2 in. between centers. The total heating surface is slightly over 9 sq. ft. and the furnace will be a simple refractory lined chamber. The boiler is gas fired, is of the single-pass type and will be hand controlled. Because of its size, experimental use and simple construction no attempt was made to attain a high efficiency in this unit.

Potentiometer Pyrometer

A NEW indicating pyrometer that uses the potentiometer system of temperature measurement has been announced by the Foxboro Company, Foxboro, Mass. This instrument is easy and convenient to use since all the adjustments are centrally located on the front cover plate. In this new pyrometer, the pointer of the galvanometer swings just above the temperature dial and is brought to balance at the same hair line index which marks the measurement on the temperature scale. The hair line is part of a glass window through which both the pointer and the scale can be viewed at the same time. Because of this feature, balancing and reading the instrument are practically one operation.

Seventeen inches of actual scale length are provided by the six inch dial. This increases the accuracy of the readings since the scale can be more finely divided. Plain black

figures add to the readability of the indicator. By the use of a selector switch, the indicator can be used to give temperature readings from any number of thermocouples located at widely scattered points. The Foxboro multiple point rotary selector switches are simple in design and may be used to connect any number of thermocouples to the indicator. These switches may be furnished for flush panel mounting as shown in the illustration.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

ONWARD—FROM THE BEGINNING. By Vernon Royle. Published by John Royle and Sons, Paterson, N. J. For free distribution.

Looking back into the 80's, as Mr. Royle does in this interesting book, again reveals the great secrecy with which the manufacture of rubber goods was surrounded in those days. It is difficult to imagine that any rubber machine could be manufactured, sold and used in rubber factories for more than twenty years before the manufacturer of that machine was permitted to see it in actual operation at a factory. Yet such was the case with the first tubing machinery turned out by Royle, who recalls many odd experiences about the rubber industry in his historical sketch all of which makes interesting reading for the factory executive of today. In addition to these trials and tribulations the development of tubing machinery is described, not in sales catalog fashion, but in a human and readable style. This book is welcomed for its addition to the historical-literature of rubber manufacture and for the record it possesses of the growth of the tubing machine to the prominent position it now occupies in rubber manufacturing.

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CALCENE DATA SHEETS. Published by the Columbia Alkali Corp., Barberton, Ohio. For free distribution.

The second series of informative data sheets dealing with the use of Calcene, a white reinforcing pigment. Tables in the sheets show results obtained with high loadings of the pigment in a variety of rubber stocks.

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ELECTROKINETIC PHENOMENA. By Harold A. Abramson. Published by the Chemical Catalog Co., Inc., 330 West 42nd Street, New York City. 331 pp. 1934. $7.50.

A discussion of the ideas and experiments from remote aspects of physics, chemistry and biology, many of them seemingly unrelated and obscure, is conducted by the author in this work. Brief mention is made of rubber tubing.

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RUBBER. Published by F. R. Henderson, 25 South William Street, New York City. 18 pp. 1934. For free distribution.

A short factual survey of the developments in the rubber industry by an authority. Mr. Henderson's aim in this pamphlet is to delineate the situation clearly and help to indicate some important general observations and conclusions. Graphs and charts are used for illustrative purpose.

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HANCOCK VALVES. Published by Hancock Valve Division, Consolidated Ashcroft Hancock Company, Bridgeport, Conn. 36 pp. 1934. For free distribution.

HANCOCK BRONZE VALVE. Published by Hancock Valve Division, Consolidated Ashcroft Hancock Company, Bridgeport, Conn. 32 pp. 1934. For free distribution.

HANCOCK GATE VALVE. Published by Hancock Valve Division, Consolidated Ashcroft Hancock Company, Bridgeport, Conn. 16 pp. 1934. For free distribution.

The importance of proper valve equipment in the industrial plant is emphasized in the pages of these attractive catalogs.

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VERTICAL MOTOREDUCERS. Published by the Falk Corporation, Milwaukee, Wis. 6 pp. 1934. For free distribution.

Unlike vertical motor, a vertical gear unit can not be merely a horizontal unit turned on end. Entirely special design is required, chiefly because of the difficult problems of lubrication encountered with vertical construction. These and other problems are met in this new line, which supplements the company's extensive range of horizontal motoreducers and horizontal, right angle and vertical speed reducers.

•

IMPROVED QUALITY THROUGH BETTER TEMPERATURE REGULATION. Published by the Brown Instrument Company, Wayne and Roberts Avenues, Philadelphia, Pa. 8 pp. 1934. For free distribution.

When temperatures fluctuate, the quality of a product is bound to suffer. Methods of accurate, automatic temperature control are described.

CHEMISTRY OF PETROLEUM DERIVATIVES. By Carleton Ellis. Published by the Chemical Catalog Co., Inc., 330 West 42nd Street, New York City. 1153 pp. 1934. $18.

The vast number of derivatives now obtainable from petroleum is thoroughly discussed in this valuable addition to chemical literature. The author delves deeply into the actual chemical substances found in these various by-products. References to the similarity of chemical properties found both in rubber and petroleum are made throughout the volume. Chapter 8 on carbon black and Chapter 26 on synthetic rubber are of particular interest to the rubber industry.

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LA GOMMA NELLE PAVIMENTAZIONI STRADALI. By R. Ariano. Reprinted from Le Strade, an Italian publication, 8 pp. For free distribution.

A reprint from an Italian periodical "Le Strade," printed in Italian, treating with the development of rubber as a paving material. Engineers of the Commune of Milan are now in the midst of making tests of rubber, cast iron and hard sandstone as paving material. The experiment with composition rubber tiles or blocks is being carried on in a street in Milan where traffic, both vehicular and pedestrian, is particularly heavy. This booklet thoroughly discusses the various angles concerned in the experiments and special compounding required.

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SOLUX. Laboratory Report No. 173. Published by Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware. 6 pp. 1934. For free distribution.

Treating with the subject of Solux, described as a non-discoloring antioxidant and preventative of fatigue deterioration. Recommendations for the use of this new antioxidant in connection with rubber and rubber products constitute the bulk of the information supplied.

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CAUSES OF DISCOLORATION IN PRESERVED LATEX. By Edgar Rhodes and K. C. Sekar. Reprinted from the Rubber Research Institute of Malaya Journal, Vol. 5, No. 2, March, 1934. 19 pp. For free distribution.

An analysis of the experimental work carried on by the Rubber Research Institute of Malaya, and the results obtained. Discoloration can be correlated with the condition of the latex in relation to incipient putrefaction caused by micro-organisms in the latex, particularly previous to ammoniation of the latex, advise the authors.

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HOW TO SELECT INSULATED CABLE. Published by General Electric Company, Schenectady, New York. 78 pp. 1934. For free distribution.

Presenting in convenient form information required in determining the cable best adapted for particular installations. The publication covers cable for the transmission and distribution of electric power at normal frequencies.

Editorial Comment

Synthetic Tires

UNDER the above head the newspapers of this country shouted the story late last month that Dayton Rubber had produced tires made from synthetic rubber. In all of these news stories and in some of the editorial comments which followed the announcements, much was made of the fact that coal, limestone, salt and water were the only ingredients needed to produce the synthetic rubber. The conclusion was also drawn that the synthetic product offered a new source of rubber in case of national need or if prices of rubber should rise to prohibitive levels.

These conclusions are true—and to the average newspaper reader carry great appeal. The rubber industry, on the other hand, is interested in other phases of the development, principally, "To what extent can DuPrene or any other synthetic rubber supplant natural rubber by virtue of the improved properties which the synthetic variety is known to give to certain types of rubber compounds?" Only last Fall a paper read by a du Pont engineer described the physical properties of DuPrene by stating that they are susceptible of wide variation, depending on the nature and amounts of vulcanizing agents, re-enforcing pigments, etc., that are compounded with it, and that it fills the need for a rubber-like material having greater resistance to the deteriorating influences of heat and oxidation than natural rubber.

It was also pointed out that tread compounds, made with DuPrene, are many times more resistant to cracking than any rubber stock that can be produced with the best antioxidants known. In addition, the paper gave a carcass and a tread compound which presumably were used as the basis for the stocks used in the Dayton synthetic tires which so successfully passed road tests in comparison with tires made of rubber.

It is possible that it may prove to be economic to use chloroprene rubber treads in conjunction with natural rubber in a sufficient amount to produce stocks that will protect against tread cracking even when loaded much more heavily with carbon black than is now the general practice. The use of this rubber in racing tires and for treads of high-speed bus and truck tires is also a possibility on account of the fact that it appears to have much better abrasion resistance than natural rubber at high temperatures, even though there is little or no difference at normal operating temperatures.

The real news in the development of synthetic tires will, in our opinion, come when some rubber manufacturer announces that his tests have proceeded to such a point that he is convinced that the use of DuPrene, or some other synthetic product, in tires is an economic proposition and is going ahead with the actual commercial manufacture and sale of a line of tires made partly from such rubbers. At the present rate, there is every hope to expect that within a few years some rubber manufacturer will have such an announcement to make.

Tire Trade's Position

TIRE profits have been severely hit by the unrest existing in that branch of the rubber industry. Two major gains have been instrumental in aiding profits this year, without which the industry would probably be in a critical position. These gains were the marked rise in unit volume of shipments and the absence of inventory losses which held back profits in former years.

Statistics compiled by the Rubber Manufacturers Association show that the average wholesale price of balloon tires in April, 1934, was $9.20, representing a 23 per cent gain over the average price in April, 1933. As compared with this gain crude rubber prices in April, 1934, were 233 per cent above that of April, 1933.

The absence of needed higher price increases to offset substantially higher costs and the adverse effect of the retail price unsettlement during the first quarter of the current year will prevent a satisfactory showing for the industry in the first six months of this year in relation to business volume and capital investment.

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Wisconsin's Unemployment Insurance

PIONEERED by the State of Wisconsin, which has adopted an Unemployment Compensation Act, effective July 1, unemployment insurance comes prominently to the fore. At present affecting only those rubber organizations with plants in that northern state, it is probable that such compensation will, of necessity, be included in the annual cost sheets of every rubber manufacturer. The primary purpose of Wisconsin's move is to add an incentive for stabilizing employment rather than as a means for relieving the unemployed.

The basic principle of the law involves the setting up of a reserve fund to be administered by the State without liability beyond the amount of the fund. Assuming that involuntary employment is justly the burden of industry the act provides for each employer's compulsory contribution each year of 2 per cent of his annual payroll to the reserve fund and 2/10 of 1 per cent of his payroll annually to the expense incurred by administration.

Separate accounts will be kept for each employer except in specific cases where a group in the same industry or locality prefer to pool their contributions. If an employer's contributions reach an amount equal to $55 for each eligible employe, it automatically drops to 1 per cent of his payroll. Other features of the law are equally as specific in demands upon the employers. Only those employers who have set up voluntary compensation plans for unemployment are exempt from the law.

CURRENT • NEWS of the Rubber Industry

JULY, 1934

GOODYEAR SCORES IN GOVERNMENT BATTLE

Wins Court's Permission Not to Make Public Specifications of Either All-Weather or All-State Rubber Tires Demanded by Prosecution

Although the Goodyear Tire & Rubber Company lost its motion for dismissal of the suit brought by the Federal Trade Commission against it alleging violation of section 2 of the Clayton Anti-Trust law, on June 23, in connection with its tire contract with Sears, Roebuck & Company, it is faring well in its battle having secured two legal victories to date.

These victories were the decision of Commission Examiner John W. Bennett, at Akron, giving the Goodyear concern the right not to make public specifications used in making its line of All-Weather tires and All-State tires, the latter being produced only for the Sears concern; and secondly the acceptance of hundreds of photostatic copies of Goodyear newspaper advertisements as evidence over the continuous objections of Federal Trade Commission attorneys. More than 2,000 reproductions of such advertisements have already been introduced.

During the testimony rendered by P. W. Litchfield, Goodyear president, on June 26, it was revealed that the General Tire & Rubber Company offered to buy the Kelly-Springfield factory at Cumberland, Maryland, in 1926, for the exclusive manufacture of special brand tires for Sears-Roebuck. The Goodyear company showed a net profit of $8,000,000 in its sales to Sears-Roebuck from 1926 to 1933.

The charge of the government body against the Goodyear Tire & Rubber Company is that it discriminated against its dealers in its contract with Sears, Roebuck & Company. Goodyear officials deny that the All-Weather and All-State tires are the same products, claiming that both brands have different properties.

Fix Dutch Indies Duty

The Commodity Exchange, Inc., reports that Reuter's news agency at Batavia has learned that the Dutch East Indian Government has fixed the export duty for native rubber on the basis of 8 cents a half kilo for dry rubber. The export duty for wet rubber came into force July 1 and for dry rubber on August 16.

TRANSPARENT BALLOON

Followers of Terpischore have found a new use for transparent rubber balloons. At least Sally Rand, who achieved fame through a fan dance, is now using the largest balloon ever constructed in her dancing act at Chicago's Century of Progress. The new dance concerns itself with a gigantic transparent bubble which is said to float away leaving the dancer standing alone in her highly abbreviated costume. The transparent balloon now being used by Miss Rand is five feet in diameter and was developed by the Anderson Rubber Company of Akron, Ohio.

TIRE GUARANTEES NOW RAISED TO 12 MONTHS

Goodyear Tire & Rubber Company, Akron, has momentarily dropped merchandising exploitation of its new G-3 brand for a sweeping guarantee of all its tires for twelve months against all road hazards. If for any reason the tires, purchased under this guarantee, do not stand up for a 12-month period, the user may return the tire to the dealer and secure an adjustment paying only for the months of service actually received. The guarantee applies to all Goodyear All-Weather and Pathfinder tires, except those in commercial service where the limit is for six months only.

Shortly after the Goodyear announcement the Firestone Tire & Rubber Company, in full page advertisements in the daily press, made an identical announcement incorporating the same provisions made in the Goodyear guarantee also raising the length guarantee to a full year.

Expect Barr Settlement

Return of workers, out on strike since April after filing charges alleging discriminatory discharge of union employees, to the Sandusky, Ohio, plant of the Barr Rubber Company, is expected momentarily. The National Labor Board, in a decision handed down on June 22, ruled that settlement of the dispute should be made on certain terms including an agreement reached at a Board hearing, placing of certain workers on the preferential list, and upholding dismissal of other individuals.

NATIONAL TIRE DEALERS CONCLUDE CONVENTION

Changing the name of their association from the National Tire Dealers' Association to the National Tire and Battery Association to permit broader operations under the code, tire dealers throughout the country gathered in Chicago the week of June 11 for their 14th annual convention. Discussion of the code from every angle was the primary topic during the three-day session.

New officers elected were George J. Erlinger, New York City, president; A. B. Chapman, Los Angeles, vice-president M. G. Byrne, Chicago, secretary-treasurer. Norval P. Trimborn, 100 N. LaSalle Street, Chicago, continues as general manager.

A study of the battery price situation was urged upon the Code Authority to determine whether an emergency existed and to set up price floor levels such as are current in the tire industry. A resolution, approving the appointment of nine members to draft a code of fair competition for the wholesale tire and battery industry, was passed upon favorably.

Decrying chiseling activities in the tire industry, J. A. MacMillan, president of the Dayton Rubber Manufacturing Company, made an earnest appeal for regulation in the rubber industry. He pointed out that in the past the dealer cared little for the manufacturer and vice-versa since the manufacturer could usually secure another dealer or acquire his business for 50 cents on the dollar and open a factory branch.

W. O'Neil, president of the General Tire & Rubber Company, Akron, in the concluding address before the convention delegates, urged fair treatment of dealers handling little known brand names by those having agencies for the nationally advertised types. He stated that tire companies had not been entirely fair with dealers for the past five years but predicted a quick change of that policy.

Propose Simplified Practice

A proposed simplified practice recommendation covering industrial truck and trailer solid tires, cured-on type, has been mailed to all interests in the industry by the Division of Simplified Practice, of the National Bureau of Standards, for their consideration and written approval.

This schedule, submitted by the standing committee of the industry in charge of the recommendation, if accepted, will be added to Simplified Practice Recommendation R103, Industrial Truck and Trailer Solid Tires, Pressed-on Type, recently revised and made effective from June 1, 1934.

CONSUMPTION IN MAY LOWER THAN IN APRIL

Consumption of crude rubber by manufacturers in the United States for the month of May amounted to 43,012 long tons, which compares with 44,947 long tons for April. May consumption shows a decrease of 4.3 per cent under April and 2.4 per cent below May a year ago, according to statistics released by the Rubber Manufacturers' Association. Consumption for May, 1933, was reported to be 44,074 long tons.

Imports of crude rubber for May were 47,954 long tons, an increase of 5 per cent over April and 74 per cent above May, 1933.

The association estimates total domestic stocks of crude rubber on hand May 31 at 351,329 long tons, which compares with April 30 stocks of 351,981 long tons. May stocks show practically no change as compared with April, but were 8.1 per cent below stocks of May 31, 1933.

The participants in the statistical compilation report 57,921 long tons of crude rubber afloat for the United States ports on May 31, compared with 56,251 long tons afloat on April 30 this year and 43,342 long tons afloat on May 31, 1933.

May reclaimed rubber consumption is estimated to be 9,500 long tons, production 10,848 long tons, stock on hand May 31, 22,887 long tons.

INJURIES DECREASING IN RUBBER FACTORIES

A report from the Rubber Section of the National Safety Council, advises that injuries of workers in rubber plants and factories are decreasing. Statistics compiled show that for the first four months of 1934 there was an increase of 42 per cent in employment compared with the number of workers in the first four months of the preceding year.

Out of a total of 31,625,666 workers there were only 186 disabling injuries during the January-April period this year, a frequency rate of 5.881. This rate tells the story briefly, a 24% reduction against an increase of man hours worked of 42%. Eight plants have had perfect records to date.

RUBBER UNION PREPARES DEMANDS ON INDUSTRY

Recently formed, the United Rubber Workers of America, an affiliate of the American Federation of Labor, is now in the midst of preparing claims and demands for presentation to manufacturers in the rubber industry. Coleman Claherty, an organizer of the labor group, was elected president of the United Rubber Workers' council on June 7.

Among the demands soon to be made to the manufacturers are a 75 cent hourly wage, 44 work weeks guaranteed per annum, and 30 hours per week, or a six hour day. A committee has been appointed, the identity of its members being kept secret, to deal with the Rubber Manufacturers Association or direct with rubber manufacturers.

The Firestone local of the union suspended forty-six members on June 11 for participation in the company's employe representation plan, termed a "company union" by the labor organization. Mr. Claherty has been in communication with William Green, president of the American Federation of Labor, who is believed to be collaborating on the demands soon to be presented to the trade.

Fisk Sues General Tire

Fisk Rubber Corporation, Chicopee Falls, Mass., entered suit against the General Tire & Rubber Company, Akron, on July 7 alleging infringement on nine patents covering the preparation and manufacture of cord fabrics in tires. The Fisk concern seeks an injunction to restrain the General company from allegedly infringing on the patents cited. An accounting and damages are also being sought.

General Atlas Issues Organ

General Atlas Carbon Company, 60 Wall Street, New York City, has started the issuance of a monthly house organ, at present confined to one photo-offset page, with the title "Carbon Joe's Gastex Gazette."

Olin in New Quarters

R. R. Olin Laboratories, Akron, Ohio, moved into new quarters in the Hower Building at 31 West Market Street, that city, on July 2. The new offices provide enlarged facilities for the testing laboratories and are located in the center of the downtown district.

APRIL TIRE PRODUCTION 52% HIGHER THAN 1933

Shipments of pneumatic casings for the month of April amounted to 4,438,378 casings, an increase of 5.1% over March and 21.5% above April (1933), according to statistics released by the Rubber Manufacturers Association, Inc.

Production of pneumatic casings for April were 4,769,980 casings, a decrease of 7.9% under March, but was 52.7% above April 1933. Casings in the hands of manufacturers April 30th, amounted to 11,980,731 units, an increase of 2.8% above March 31, 1934 stocks and 76.9% above stocks April 30, 1933.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	*Production*	*Inventory*
April., 1934	4,438,378	4,769,980	11,980,731
March., 1934	4,222,962	5,180,122	11,650,661
April., 1933	3,653,943	3,123,494	6,773,724

Reports Increase of Labor

An increase in direct labor amounting to 104.4% for the first four months of 1934, as compared with the same period in the preceding year, is reported by the Pennsylvania Rubber Company, Jeannette, Penna. The total factory payroll showed an increase of 82.1% for the same period. Employee personnel has increased in excess of 50%.

Tires from Synthetic Rubber Announced

J. A. MacMillan (left) and A. L. Freedlander (right) Examining Tire of Synthetic Rubber.

Continuing its development of products made with DuPrene, the synthetic rubber produced by DuPont, the Dayton Rubber Mfg. Co., Dayton, Ohio, on June 20 announced the manufacture, for the first time, of tires and tubes composed of synthetic rubber instead of natural crude rubber. The tires have been given exhaustive laboratory and road tests and were found to be fully equal to regular tires as regards wear and toughness. The development of this tire was credited to A. L. Freedlander, Vice President and Factory Manager.

As to how extensively synthetic rubber would be used in the near future, Mr. MacMillan, President of Dayton Rubber, stated that this depended largely upon what might transpire in the world rubber market. He pointed out that the Dayton company had just erected a new building which is to be used for the development and manufacture of articles made from synthetic rubber. He expressed himself as optimistic over the outlook for the use of synthetic rubber in this country not only in tires but in all classes of rubber products.

RUBBER TRADE CONTINUES TO BATTLE CODE RULINGS

Terms outlined by the Rubber Code continue to meet with the vehement disapproval of the trade in general. Particularly did the 90-day guarantee incorporated in the fair trade practice section of the retail code grate upon the smaller manufacturers, who, at a public hearing held in Washington on June 5, contended that they would lose out unless they were permitted to continue long term guarantees. These complainants included the Seiberling Rubber Company, Pharis Rubber & Tire Company and the Gates Rubber Company.

General Hugh S. Johnson, administrator of the NRA. finally suspended the 90-day clause indefinitely on June 15. Immediately thereafter the Goodyear Tire & Rubber Company, closely followed by Firestone, raised their guarantee on all tires to one full year. The position of the National Recovery Administration, however, has not been made sufficiently clear, but an impending guarantee war is believed sufficient to bring about a definite statement from code authorities.

Manufacturers in the rubber footwear division are also facing an industrial battle the outcome of which may affect all sales policies in that branch of the industry. On June 18 the Federal Trade Commission cited three manufacturers, Phillips-Baker Rubber Company, La Crosse Rubber Mills Company and the Goodyear Rubber Company, for violation of the code of fair competition. The specific charge was that all three companies had failed to file their respective price schedules with the industry's code authority. The complaint further states that the concerns in question diverted trade to themselves on the basis of selling goods less than the listed price. One object of the battle is to determine industry's right to fix or to refuse to fix prices.

In the retail division of the rubber tire and battery trade General Johnson issued an order on June 28 permitting members of that section to make quotations of tires or tubes at net realized prices not less than 10 per cent below the lowest reasonable costs of the respective brands concerned in the bidding. This order applies only in bidding for contracts from governmental agencies. This action was taken because of an earlier executive order granting limited exceptions in cases where code provisions conflict with the "usual procedure or statutory provisions" relating to government contracts.

An application by the code authority for the rubber tire manufacturing industry for permission to have trade practice complaints under the code handled by a special committee was approved on June 15. This committee includes: A. L. Viles, chairman, Rubber Manufacturers Association; I. Eisbrouch, McClaren Rubber Company; R. S. Wilson, Goodyear Tire & Rubber Company. L. H. Jackson, Firestone Tire & Rubber Company; C. Borland, Mohawk Rubber Company; and J. W. Whitehead, Norwalk Tire & Rubber Company. The committee will handle all complaints for a 60-day period except those dealing with labor provisions of the code.

The rainwear division of the rubber manufacturing industry submitted a proposed budget of $37,650 for administering the code from April 1 to December 31, 1934 to General Johnson on June 14. This has yet to be passed upon.

Members of Rubber Code Authority

The following is a list of members and chairmen and their alternates of the various divisional and sub-divisional code authorities of the rubber manufacturing industry as announced by the National Recovery Administration on July 2:

CODE AUTHORITY FOR RUBBER MANUFACTURING INDUSTRY

(Consisting of Chairmen of the several Divisional Code Authorities)

I. A. L. Viles, Chairman, Rubber Mfrs. Ass'n., 444 Madison Ave., N. Y. C.
II. M. I. Woythaler, Hodgman Rubber Co., Framingham, Mass.
(Alternate) N. E. Bowman, Pocono Co., Trenton, N. J.
III. O. C. Pahline, Goodyear Tire & Rubber Co., Akron, Ohio
(Alternate) M. A. Turner, Stedman Rubber Flooring Co., So. Braintree, Mass.
IV. T. J. Needham, U. S. Rubber Co., 1790 Broadway, N. Y. C.
(Alternate) A. B. Newhall, Hood Rubber Products Co., Watertown, Mass.
V. F. D. Hendrickson, American Hard Rubber Co., 11 Mercer St., N. Y. C.
(Alternate) Bruce Bedford, Luzerne Rubber Co., Muirhead Ave., Trenton, N. J.
VI. R. E. Drake, Avon Sole Co., Avon, Mass.
(Alternate) H. T. Mason, Quabaug Rubber Co., North Brookfield, Mass.
VII. J. H. Connors, B. F. Goodrich Co., Akron, Ohio
(Alternate) H. N. Young, Hamilton Rubber Mfg. Co., Trenton, N. Y.
VIII. B. B. Felix, Featheredge Rubber Co., 340 W. Huron St., Chicago, Ill.
(Alternate) Geo. B. Dryden, Dryden Rubber Co., 1014 S. Kildare Ave., Chicago, Ill.
IX. F. T. Lane, Seamless Rubber Co., New Haven, Conn.
(Alternate) T. W. Casey, Seiberling Latex Products, Barberton, Ohio
X. Wm. Lichtenstein, Peerless Garment Co., 231 Harrison Ave., Boston, Mass.
(Alternate) Moe Sherman, Shermen Bros. Rainwear Co., 205, W. 39 St., N. Y. C.

DIVISIONAL CODE AUTHORITIES

II. Auto Fabrics, Proofing & Backing Division

M. I. Woythaler, Chairman, Hodgman Rubber Co., Framingham, Mass.
(Alternate) A. K. Dannebaum, Alden Rubber Co., 1104 Wood St., Phila., Pa.
J. T. Callahan, Archer Rubber Co., Milford, Mass.
(Alternate) C. Kenyon, Jr., Vulcan Proofing Co., 1st Ave. & 58th St., Brooklyn, N. Y.
R. M. Freydberg, Acme Backing Corp., Meadow & Bogart Sts., Brooklyn, N. Y.
(Alternate) F. W. Kite, Windram Mfg. Co., 3 Dorchester St., S. Boston, Mass.
N. E. Bowman, Vice Chairman, Pocono Co., Trenton, N. J.
(Alternate) J. D. Lippman, Textileather Corp., Stickney Ave., Toledo, Ohio
W. H. Jenks (Representing Reading), L. C. Chase & Co., 295 5th Ave., N. Y. C.
(Alternate) N. Boynton, Jr., Boston Woven Hose & Rubber Co., Box 1071, Boston, Mass.

III. Rubber Flooring Division

C. C. Pahline, Chairman, Goodyear Tire & Rubber Co., Akron, Ohio
(Alternate) Winthrop Brown, Jr., Hood Rubber Products Co., Watertown, Mass.
W. G. Titus, Hamilton Rubber Mfg. Co., Trenton, N. J.
(Alternate) W. I. Lewis, Boston Woven Hose & Rubber Co., Cambridge, Mass.
M. A. Turner, Alternate Chairman, Stedman Rubber Flooring Co., S. Braintree, Mass.
(Alternate) H. T. Mason, Quabaug Rubber Co., No. Brookfield, Mass.

IV. Footwear Division

T. J. Needham, Chairman, U. S. Rubber Co., 1790 Broadway, N. Y. C.
(Alternate) A. B. Newhall, Hood Rubber Products Co., Watertown, Mass.
C. E. Speaks, Firestone Footwear Co., 141 Brookline Ave., Boston, Mass.
(Alternate) J. F. Muffley, Endicott-Johnson Corp., Endicott, N. Y.
A. H. Weschler, Converse Rubber Co., Malden, Mass.
(Alternate) C. E. Little, Servus Rubber Co., Rock Island, Ill.

V. Hard Rubber Division

F. D. Hendrickson, Chairman, American Hard Rubber Co., N. Y. C.
(Alternate) Bruce Bedford, Luzerne Rubber Co., Trenton, N. J.
J. A. Smith, Hood Rubber Products Co., Watertown, Mass.
(Alternate) O. S. Dollison, Republic Rubber Co., Youngstown, Ohio.
D. N. Hill, Vice Chairman, B. F. Goodrich Co., Akron, Ohio
(Alternate) S. H. Renton, Vulcanized Rubber Co., N. Y. C.
H. T. Fowler, Continental Rubber Works, Erie, Pa.
(Alternate) H. H. Martindell, Jos. Stokes Rubber Co., Trenton, N. J.
J. L. Hunter, Ahlbell Battery Container Corp., Waukegan, Ill.
(Alternate) S. T. Campbell, Aetna Rubber Co., Ashtubula, Ohio

VI. Heel & Sole Division

R. E. Drake, Chairman, Avon Sole Co., Avon, Mass.
(Alternate) J. T. Mason, Quabaug Rubber Co., North Brookfield, Mass.
T. Dabney, Goodyear Tire & Rubber Co., Akron, Ohio
(Alternate) H. A. Derry, U. S. Rubber Co., 1790 Broadway, N. Y. C.
Miah Marcus, Panther-Panco Rubber Co., Stoughton, Mass.
(Alternate) M. D. Maskrey, B. F. Goodrich Co., Akron, Ohio.
R. H. Cory, O'Sullivan Rubber Co., N. Y. C.
(Alternate) Sol Schwaber, Monarch Rubber Co., Inc., Baltimore, Md.
E. Eisen, Holtite Mfg. Co., Baltimore, Md.
(Alternate) H. S. Maddock, Essex Rubber Co., Inc., Trenton, N. J.

VII. Mechanical Rubber Goods Division

J. H. Connors, Chairman, Goodrich Rubber Co., Akron, Ohio
(Alternate) W. C. Wining, Goodyear Tire & Rubber Co., Akron, Ohio
C. D. Garretson, Electric Hose & Rubber Co., Wilmington, Del.
(Alternate) P. H. Henkel, Continental Rubber Works, Erie, Pa.
H. H. Young, Hamilton Rubber Mfg. Co., Trenton, N. J.
(Alternate) A. C. Kingston, Boston Woven Hose & Rubber Co., Cambridge, Mass.

VIII. Sponge Rubber Division

Benjamin B. Felix, Chairman, Featheredge Rubber Co., Chicago, Ill.
(Alternate) George B. Dryden, Dryden Rubber Co., Chicago, Ill.
F. M. Daly, Sponge Rubber Poducts Co., Derby, Conn.
(Alternate) R. J. Limbert, Lee Tire & Rubber Co., Conshohocken, Pa.
L. H. Chenoweth, B. F. Goodrich Co., Akron, Ohio
(Alternate) Geo. E. Jeandheur, Elmhurst Rubber Co., Elmhurst, N. Y.

(Continued on following page)

IX. Rubber Sundries Division

F. Thatcher Lane, Chairman, Seamless Rubber Co., New Haven, Conn.
(Alternate) T. W. Casey, Seiberling Latex Products Co., Akron, Ohio
H. B. Elmer, Eberhard Faber Rubber Co., Newark, N. J.
(Alternate) Robert Sauter, A. W. Faber, Inc., Newark, N. J.
F. J. Wilson, Wilson Rubber Co., Canton, Ohio
(Alternate) H. P. Croxton, Massillon Rubber Co., Massillon, Ohio
T. W. Casey, Seiberling Latex Products Co., Akron, Ohio
(Alternate) E. I. Kilcup, Davol Rubber Co., Providence, R. I.
H. A. Bauman, B. F. Goodrich Co., Akron, Ohio
(Alternate) W. R. Douglas, U. S. Rubber Co., N. Y. C.

X. Rainwear Division

New England

Fred Monosson, Cosmopolitan Mfg. Co., Cambridge, Mass.
(Alternate) Sam Goldstein, Old Colony Mfg. Co., Boston, Mass.
Wm. Lichtenstein, Chairman, Peerless Garment Co., Boston, Mass.
(Alternate) Robert P. Cable, Cable Raincoat Co., Boston, Mass.

New York

Moe Sherman, Vice Chairman, Sherman Bros. Rainwear Co., N. Y. C.
(Alternate) Charles Plottel, Plottel Bros., N. Y. C.
Simon Harris, Harris Raincoat Co., N. Y. C.
(Alternate) Davis Asch, Quality Coat Co., N. Y. C.

Mid-West

A. D. Usow, Badger Raincoat Co., Port Washington, Wisc.
(Alternate) F. F. Sommers, Jr., Chicago Rubber Clothing Co., Racine, Wisc.
A. B. Zuckert, A. B. Zuckert Co., Milwaukee, Wisc.
(Alternate) Max Kovitz, Atlas Raincoat Mfg. Co., Chicago, Ill.

Vulcanizing Division

James J. Drummey, U. S. Rubber Co., Cambridge, Mass.
(Alternate) George E. Goodwin, Archer Rubber Co., Milford, Mass.

EXPECTING SETTLEMENT IN GENERAL TIRE STRIKE

Early settlement of the strike currently in force at the Akron plants of the General Tire & Rubber Company is foreseen as we go to press. The strike has been in effect since June 20 and was presumably called because of worker's complaints concerning transferrals, seniority rulings and requests for wage increases.

Ralph Lind, secretary of the Cleveland regional labor board, is in charge of conferences attempting to reach a mutual satisfactory agreement between officials of the tire company and the local of the United Rubberworkers' Union. According to Mr. Lind all major difficulties have been overcome, there remaining but a few minor adjustments to be concluded.

Workers were willing, according to report, to return to their jobs providing the company union was abolished. This remains one of the points to be ironed out. The new National Labor Board, which became operative on July 9, was expected to have sufficient authority to end the deadlock and settle existing differences.

TIRE PRICES INCREASED TO AUTOMOBILE MAKERS

Since the code has raised manufacturing costs fully 28 per cent tire manufacturing companies during the early days of this month increased the prices on original equipment sales to motor manufacturers. In some cases the increase amounted to as much as 15 per cent, although the average was from 7 to 10 per cent.

This is the first price change in original equipment since January, 1934, when a slight price rise was instituted. In the retail field price cutting by dealers has, brought retail tire prices in many localities close to the minimum floor prices inaugurated by the National Recovery Administration.

It is believed that the current confused situation in the retail field is due to the slowness of recovery officials in setting up enforcement machinery to police the code in various localities.

CHANGES ARE MADE IN TIRE CODE AUTHORITY

Three specific changes were made in the personnel of the code authority of the Rubber Tire Manufacturing Industry, it was announced on July 6 from code headquarters in Washington. A complete list of members of this code authority was contained in the February, 1934, issue of The Rubber Age.

The changes made were: J. W. Thomas, president, Firestone Tire & Rubber Company, replaced H. S. Firestone, of the same concern; E. S. Levy, president, Fisk Rubber Corporation, an alternate, who resigned on January 13, was re-elected; and Harry C. McCreary, president, McCreary Tire & Rubber Company, an alternate, was appointed to replace J. W. Whitehead of the Norwalk Tire & Rubber Company.

End La Crosse Rubber Strike

1400 employees of the La Crosse Rubber Mills Company, La Crosse, Wisconsin, returned to work on July 3 concluding a labor strike in progress since April 24. An agreement, ratified between company officials and the United Rubber Workers Federal Union, ended the strike. The agreement restrains the La Crosse company from making any statements "detrimental to the union."

New Rubber Products Company

The Salem Rubber Products Company has been incorporated at Salem, Ohio. Incorporators include George Wheatley, J. E. Bauknecht and William Rosenbloom. 250 shares of no-par stock was listed. Temporary offices are located in the Overlander Building, in Salem.

Synthetic Rubber Creator

Father J. A. Nieuwland

FATHER Julius Arthur Nieuwland, C.S.C., of the University of Notre Dame, South Bend, Indiana, is the individual to whom credit is given for unferreting the component parts used in synthetic rubber production, back in 1906.

He is a serious-minded professor of chemistry, a tireless laboring priest and one of the country's leading systematic botanists. Happy when playing with test tubes and chemicals in his laboratory on the third floor of Chemistry Hall at Notre Dame, Father Nieuwland derives much pleasure from his work and once when asked by a magazine to write an article on his hobbies, he wrote on botany. Every student at the university who has come in contact with him has learned to respect him highly.

Father Nieuwland was born in Hansbeke, Belgium, Feb. 14, 1878, and came with his parents to South Bend in 1880. His early education was gained in the South Bend public and parochial schools and he was graduated from Notre Dame in 1899, receiving the degree of Bachelor of Arts.

In 1904 Catholic University presented him with the Doctorate of Philosophy and in 1911 Notre Dame awarded him his degree of Doctor of Science. In 1903 he was ordained a priest in the Congregation of Holy Cross. He began his teaching career at Notre Dame in 1904.

Through the friendship of Father Nieuwland and Prof. E. L. Greene, the Greene Library of Botany, declared to be one of the best in the country, was presented to Notre Dame.

Father Nieuwland is a member of the American Chemical Society; Deutsche Chemische Gesellschaft; Indiana Academy of Science and a number of other organizations. He speaks and writes eight different languages.

Financial News

UNITED CARBON COMPANY ANTICIPATING PROFITS

Preliminary indications are that the earnings of the United Carbon Company for the second quarter of the fiscal year will equal or exceed the $309,863 net profit, after all charges, reported for the preceding quarter, according to the *Wall Street Journal*, despite the usual seasonal trend.

Net profit earned in the first quarter was equal to 76 cents a share on the 370,127 shares of common stock after allowing for dividend requirements on the 7% preferred. For the June quarter the financial newspaper predicts payments on common stock between 75 and 80 cents a share.

Carbon black shipments picked up sharply in the June quarter being roughly 200 per cent of the volume of the first quarter, most of which went to the tire industry. Although domestic carbon black shipments are naturally expected to slow down in the third quarter, the United Carbon concern does a large export business which is expected to hold up the sales volume.

FIRESTONE HAS PROFIT FOR FIRST SIX MONTHS

Firestone Tire & Rubber Company, Akron, showed a profit of $1,521,745 for the first six months of the fiscal year comparing with a loss of $1,576,000 for the same period in the preceding year. The profit-announcing report was released by Harvey S. Firestone, Sr., on June 14.

The report also cited a 30 per cent increase in wages in the last year to Firestone employees, a 103 per cent boost in the company's payrolls for the first six months of this year in the Akron plants, and an employment rise of 53 per cent over a year ago.

A quarterly dividend of 10 cents a share on the common stock of the company was voted by directors on June 22. This dividend will be paid to stockholders on record as of July 5.

Baldwin Earns $58,574

The Baldwin Rubber Company, Pontiac, Michigan, reports a net income of $58,574 for the quarter ending March 31, 1934. This is equal to 40 cents a share on 100,770 Class B shares after $1.50 Class A dividend requirements.

AKRON TIRE FACTORIES IMPROVING POSITIONS

Executives of rubber and tire factories in Akron report steady improvement over previous years along the line of increased employment and higher wages, P. W. Litchfield, president of Goodyear Tire & Rubber Company, declared that the payroll at that company was 90 per cent greater for the first five months of the current year than in the corresponding period last year. The payroll to June 1st of this year was $11.486.000.

Regarding wage scales, Harvey S. Firestone, points to a 76.1 cent-an-hour average at Firestone Tire & Rubber Company, against 56.1 for all industries. Employment at the Firestone plants has gone up 53 per cent with more than 4,000 more on the payrolls than a year ago.

On the basis of March figures showing 42,000 employed at the four largest plants, which is indicative of 50,000 in mid-June, employment figures in Akron have approximately doubled over the preceding year. 19,000 employes are at work at Goodyear plants alone.

GOODYEAR OF CANADA IMPROVES ITS SURPLUS

Chairman C. H. Carlisle, of the Goodyear Tire and Rubber Company of Canada, pointed out the fact that the company's current position is steadily improving, with dividends being earned and surplus increased, in his letter accompanying quarterly dividend checks.

Earned surplus, as of June 30, after deducting dividends for six months, stands at $8,069,421, which is $713,575 more than a year ago. In addition there is a capital surplus of $443,068. Chairman Carlisle also pointed out that the number of tire units produced and sold in the first six months of the year showed an increase of 64.8 per cent.

British May Raise Prices

A United Press report, dated June 6, advised that price of British manufactured rubber goods, with the exception of tires, may be increased from 10 to 15 per cent. To date no further indication has been received that such a price rise has been put into effect.

Operations Tax for Dutch

A tax of ½ cent per K.G. of the exportable quantity of plantation rubber, calculated into dry rubber, for the first control year, has been instituted by the Netherlands. This tax is intended to pay the costs of executing the regulations involved in the new rubber restriction plan. It is payable at the delivery of the relative licenses.

Standard Products Moving

Standard Products Company, Cleveland, is in the midst of moving the remaining half of its plant at that city to Port Clinton, Ohio, where it will occupy the former factory site of the Wildman Rubber Company. The first half of the Cleveland plant was moved to Marine City, Michigan. The Standard concern is alleged to manufacture 80 per cent of the channel rubbers used in the automotive and airplane industries.

Ritter Seeking Location

Ritter Rubber Company, now located at 1435 West 9th Street, Cleveland, of which R. B. Ritter is general manager, is seeking a new factory location to expand its manufacturing facilities. According to report the concern will manufacture and assemble patented rubber specialties. The plant, when secured, is expected to employ 100.

MONSANTO TO PRODUCE PETROLEUM CHEMICALS

Monsanto Petroleum Chemicals, Inc., a controlled affiliate of Monsanto Chemical Company, has been organized. The new company will have headquarters in Dayton, Ohio, and will take over the plants and process of The Dayton Synthetic Chemicals Company.

The latter company produces a resin made from petroleum gases, in which field of chemistry Monsanto has done considerable research. Patents and processes of both Monsanto and Dayton Synthetic are pooled in Monsanto Petroleum Chemicals, Inc., which will undertake their development and continue research in the field of petroleum chemistry.

Edgar M. Queeny, President of Monsanto Chemical Company, is president of Monsanto Petroleum Chemicals, Inc. Charles A. Thomas of Dayton is Vice-President and General Manager and will be in charge of the administration of the company.

In addition to Messrs. Queeny and Thomas, the directors of the new company are: Gaston Du Bois and L. A. Watt of St. Louis; Charles Belknap and Charles Curtis of Boston; Nelson Talbott and Charles Mead of Dayton; and Harold Talbott of New York.

NEW GOODRICH UNIT FOR EMPLOYEE RECREATION

Cration of a new department devoted to the promotion and development of recreational activities among its employees is announced by the B. F. Goodrich Company. Coincident is the appointment by T. G. Graham, vice-president, of Dave Straiton, official in the Miller division of the company, to the newly created post as director of recreation.

"This new activity has been authorized solely to provide an organized channel through which recreation activities can be promoted and developed," Graham said. "Its objective is to provide organized recreation for Goodrich people within their own ranks. There is no intention of entering city-wide competition, either with other industrial teams, or others."

Straiton joined Miller in April, 1913, has been general foreman in charge of production in several departments since 1925.

GOODRICH TAKES OVER RUBBER HEEL BUSINESS

B. F. Goodrich Rubber Company, Akron, has taken over the entire domestic rubber heel business of the United Shoe Machinery Company, and will handle all sales direct to purchasers. The Ohio rubber concern formerly produced the rubber heels merchandised by the shoe machinery company under the trade names of D and Keyscroll Heels.

In its advertising to the boot and shoe trade, advising it of the new arrangement, the Goodrich firm also announced the introduction of a new rubber heel to be known as the Vogue wood-base heel.

LITCHFIELD, OF GOODYEAR, FAVORS PEGGING OF PRICES

In an address before the National Association of Purchasing Agents on June 18, P. W. Litchfield, president of the Goodyear Tire & Rubber Company, Akron, favored price protection against the tactics of unprincipled minorities. Although not attacking the National Recovery Administration's policies, Mr. Litchfield claimed that "the government has tried to do too much and is interfering with business."

Discussing the problems and programs of industry in general the Goodyear president saw no reason why this country should "discard the policies and the system of economics which in the past gave it an era of great prosperity and the highest standard of living ever known to mankind."

STORY OF CRUDE RUBBER TOLD AT CHICAGO FAIR

Visitors to Chicago's Century of Progress are being given every opportunity to familiarize themselves with the development of rubber from its crude stages to finished rubber products. The U.S. Rubber Company, in its exhibit in the Ford Exposition Buildings at the Fair depicts life and activity on a rubber plantation, production of crude rubber from latex, milling and compounding of rubber, actual manufacture of a rubber product and various testing apparatus.

In the Firestone Factory and Exhibition Building a reproduction of a plantation supplied with actual trees brought from the company's Liberia, Africa, plantations, is the chief feature. Various steps shown include tapping, the preparation mill, coagulation, sheeting, smoking, drying and baling.

Skinner Tire Wins Decision

A decision affecting the entire tire retreading industry was awarded in favor of the Skinner Tire & Rubber Company, Dayton, on July 6, by U. S. Judge R. R. Nevin, in that city. The suit involved payment of taxes based on the amount of rubber used in making retreaded tires. The government has a tax of 2.5 cents per lb. on all such rubber. Selling for one-third as much as new tires, retreaded tires are from six to ten lbs. heavier. The decision exempts retreaders from payment of this rubber tax.

Strike at Hankins Plant

Thirty employees of the Hankins Rubber Company, Massillon, Ohio, went out on strike June 20 alleging unfair discrimination. The strikers are affiliated with the rubber union, and are said to be seeking higher wages and union recognition. Attempts to reach an agreement have not yet proved successful.

Lease Fostoria Rubber Plant

The Independent Rubber Company, of Akron, has leased the plant and equipment of the defunct Floral City Rubber Company in Fostoria, Ohio. Production of rubber gloves and balloons is expected to start shortly.

Great Lakes to Move

Great Lakes Rubber Company, Cleveland, has taken a lease in the White Sewing Machine group of buildings off Main Avenue in that city, to occupy the entire first floor. The lease is for a five year period at an annual rental of $4,000. The company, now located at Independence Road and Jefferson Avenue, S. E., Cleveland, manufactures numerous rubber products including battery boxes, and will take possession of its new quarters as soon as alterations are completed.

Deny Thermoid Petition

The petition of a noteholder for an equity receiver for the Thermoid Company, was denied on July 7 by Vice Chancellor Egan of the New Jersey Chancery Court, Jersey City, N. J. The petition was requested on the ground that payment was not forth-coming on principal of 6 per cent notes due on February 1, 1934. A three year extension was sought by the company on these notes.

Reduce Prices on Tornesit

Hercules Powder Company, Wilmington, Delaware, have announced substantial price reductions on Tornesit, the chlorinated rubber protective coating base. Encouraging reception for the new product is said to have led to the price decrease.

GREATER POWERS GIVEN TIRE CODE OFFICIALS

National Recovery Administrator Hugh S. Johnson issued an order on June 28 delegating to the Division Administrator in charge of the code for the Retail Rubber Tire and Battery Trade (at present C. E. Adams) the following functions:

To approve on behalf of the Administrator the establishment of regional Control Boards; to approve the reclassification of any brand of tire or tube as justice may require where inequalities or errors appear to exist; and to approve the establishment of lowest reasonable cost of any size tire or tube which may have been omitted in said schedules or not otherwise provided for.

Tire Plant for Africa

Durban, South Africa, will be the site for a new plant for the production of tires and general rubber goods to be erected within a year by the Dunlop Rubber Company, London. Rubber shoes will constitute one of the chief outputs of the plant when constructed. Some four hundred people will be employed.

Cabot, Inc. Moves Offices

Godfrey L. Cabot, Inc., producers of carbon black, has moved its executive offices from the Old South Building, Boston, where they have been located for a quarter century, to 77 Franklin Street, same city.

Rickenbacker Given Plaque by U. S. Rubber Company

Eddie Rickenbacker, president of the Indianapolis Motor Speedway, noted wartime ace, was presented with a silver, gold and copper plaque on the occasion of the 25th anniversary of the Speedway by the U. S. Rubber Company. W. B. Harding, president of the rubber concern, made the presentation. Roscoe Turner and Amelia Earhart, noted fliers, were interested spectators. It is believed that the historic plaque is the first trophy ever offered in connection with the famous racing classic. Among the prizes awarded at the running of the first classic twenty-five years ago was one donated by the G. & J. Tire Company, which is now the U. S. Tire Company, a subsidiary of the U. S. Rubber organization.

Awards Trophy

W. B. Harding, president of the U. S. Rubber Company, presents Eddie Rickenbacker with an historic silver, gold and copper plaque. Left to right: Eddie Rickenbacker, Amelia Earhart, Roscoe Turner and W. B. Harding

NEW AIRPLANE DE-ICER USED ON TRANSPORTS

Recent tests by aviation engineers have demonstrated the effectiveness of an improved type airplane de-icer that may enable air transportation to overcome the obstacle of icing conditions along airways.

With almost unnoticeable "sleeves" of balloon silk drawn over the front of its wings and tail surfaces, a three-mile-a-minute twin-engined transport, carrying aeronautical engineers of United Air Lines and the B. F. Goodrich Company, recently took off from a sweltering airport and climbed to 19,000 feet to seek ice-forming conditions.

When ice began to appear on the leading edge of the wing of the all-metal plane, the pilot of the plane turned a valve on an air pump. The sleeves swelled up, and the ice cracked and blew off in the air stream.

The air transport company will continue exhaustive service tests of the improved device, probably preceding installation of the de-icers on all United planes flying over the New York - Chicago - Pacific Coast, Chicago-Dallas, and other airways.

The original type of "overshoe" de-icer consisted of rubber sheets mounted over the leading edges of the wings and tail surfaces. When ice formed on the front of the wing, the rubber sheets were inflated by air pressure. Disadvantages of this type were excessive weight and bulk, the installation for a transport plane of the type of United's fleet being 150 pounds.

By substituting balloon silk for rubber in an ingenious manner, weight of the de-icer was slashed to forty-five pounds to make it feasible for use on air liners. Strips of balloon silk sewn to form a series of tubes are placed over the front edge of the wings, their elastic rubber edges being cemented to the wing surfaces. Air is pumped through conduits leading to the silk tubes, and it inflates the sleeves to cause the removal of ice by changing the contour of the wing. When the air is expelled, the sleeve flattens out against the curve of the wing.

The recently perfected de-icer is expected to increase the number of trips completed by air lines in the winter.

Appoint Foreign Licensees

Exclusive license contracts have been signed with leading electric wire and cable manufacturers in five European countries by Thiokol Corporation, Yardville, New Jersey. The contracts, made through its subsidiary, Thiokol Ltd., are with the following: British Insulation Cables, Ltd., Prescot, Lancaster, England; Felten & Guilleaume Carlswerk, Cologne, Germany; Forges et Ateliers de Constructions Electriques de Jeumont (Nord) France; Societá Italiana Pirelli, Milan, Italy; Comercial Pirelli, S. A., Barcelona, Spain.

Annual Frolics Planned

Monday, August 13, will be the date of the B. F. Goodrich Company's annual "play day," to be staged at Euclid Beach Park, in Cleveland. Dave Straiton, recreational director of the tire company, is handling details for the outing, which is expected to draw a crowd of more than 40,000.

The Goodyear Tire & Rubber Company's annual frolic is also scheduled for the Cleveland picnic grounds, one week later on August 20. Fred Colley is in charge of Goodyear activities.

Obituaries

Fred M. Harpham

Fred M. Harpham, vice-president of the Goodyear Tire & Rubber Company, Akron, Ohio, and of the Goodyear Zeppelin Corporation, died at the Akron City Hospital

F. M. HARPHAM

on June 12th after a losing battle with a severe illness for several weeks. He was born in Akron, March 7, 1875, and became a director of the Goodyear organization in 1923. In 1929 he was elected a vice-president, serving in that capacity up to the time of his death.

Funeral services were conducted by Rev. B. Z. Stambaugh, pastor of the Church of Our Saviour, Episcopal, at the Harpham residence. Honorary pallbearers included P. W. Litchfield, president of the Goodyear Tire & Rubber Company, and Charles Akers, president of Akers and Harpham Company.

Mr. Harpham is survived by his widow, daughter, mother, three sisters and a stepson.

Sir Leybourne F. W. Davidson

Sir Leybourne F. W. Davidson, termed the founder of the modern rubber industry, died at Worthing, England, June 24th. The first cultivated rubber plants by English botanists were sent to Sir Leybourne's tea and coffee plantations in Ceylon after being cultivated in England from seeds secured from South America.

Robert E. Christie, Jr.

Robert E. Christie, Jr., member of the Goodyear Board of Directors, president of the Investment Bankers Association of America, and member of the New York investment banking firm of Dillon, Read & Company, died on June 25th. Death came while Mr. Christie was aboard an airplane near the Ohio-Indiana state line and was attributed to heart disease.

A member of the Goodyear Board of Directors since 1928, he is survived by his widow, father and two children.

Henry C. Geer

Henry C. Geer, 77, former superintendent of the mechanical goods department of the B. F. Goodrich Company, died on June 11 at his home in Silver Lake Village, Ohio. Funeral services were held at his residence, with Rev. Ernest E. Noack officiating. Burial was in Glendale Cemetery.

The deceased left a widow, five sons and one sister.

Noyes E. Alling

Noyes E. Alling, 71, former head of the Alling Rubber Company, Hartford, Conn., died on June 19th from monoxide poisoning. He had been in ill health for several years. He founded the Alling Rubber Co. in 1890 with one store, later consolidating additional outlets before branching out in New England.

Mr. Alling was born in Oxford, Connecticut, 71 years ago. He leaves three daughters and three brothers.

Arthur C. Macy

Arthur C. Macy, credit manager, Raybestos Division, Raybestos-Manhattan, Inc., Bridgeport, Conn., died unexpectedly on June 22, a few minutes after reaching his home from Cleveland where he had attended an association meeting of the Motor and Equipment Manufacturers Association.

Amos P. Mitchell

Amos P. Mitchell, president and treasurer of the Alling Rubber Company, Hartford, Conn., died on June 4 from a shock received several weeks prior to that date. He was actively associated with the Alling concern practically from the start of the organization, taking over the business several years ago.

The funeral was held on June 6; burial was in Newton Cemetery, Newton, Conn. He is survived by a son, a brother, two sisters and five grandchildren.

Hyman A. Rosenthal

Hyman A. Rosenthal, owner of the Nearpara Rubber Company, and president of the Jefferson Warehouse Company, Trenton, N. J., died June 14, at his home, 831 Berkeley Avenue, Trenton, following a lengthy illness. He was 60 years old. Mr. Rosenthal organized the Nearpara Rubber Co. many years ago and was associated in the business with his sons, Benjamin and Sidney.

Besides his sons, he is survived by his wife, three daughters and a brother. Burial was at Trenton.

. . . A new rubber net binder for tennis nets to replace worn binding was recently introduced by the Linen Thread Company. This same company is marketing "Stay-White" rubber tennis tape for marking the lines on tennis courts.

Names in the News

HERMAN RESSEGER, manager of mechanical goods time study, of the B. F. Goodrich Company, Akron, Ohio, presented the subject, "A Foreman's Responsibility in Organizing Work Before Time Study," at a meeting of the National Foremen's Association in Wheeling, West Virginia, on June 16th. Five associates accompanied Mr. Resseger to demonstrate modern methods now in use at the Akron rubber factory.

HARVEY S. FIRESTONE, JR., vice-president of the Firestone Tire and Rubber Company, Akron, Ohio, is now serving as chairman of a committee of Episcopal laymen to stimulate interest in the church's program in the Ohio diocese and has accepted the responsibility for Ohio's share in the support of the National Council.

W. T. CLAYTON, formerly manager of the Goodyear Supervisional plan of the Goodyear Tire and Rubber Company, Akron, Ohio, was appointed manager of the Goodyear Production Flying Squadron on June 14th.

L. D. TOMPKINS, in the service of the United States Rubber Company for many years, has been appointed general manager of that company's tire division, including all tire sales and the operation of tire plants in Detroit, Indianapolis, Eau Claire and Los Angeles.

ARTHUR KELLY, tire engineer of the B. F. Goodrich Company, has returned to the Akron, Ohio, offices of the company, after spending several years as a technical adviser at the plant of the Yokohama Rubber Co., Ltd., in Yokohama, Japan.

W. C. WRIGHT, formerly shift foreman of airbags, pit preparation and tire curing at Plant 2 of the Goodyear Tire and Rubber Company, has been advanced to manager of the Goodyear Supervisional plan. He takes W. T. CLAYTON'S position, the latter having been appointed manager of another division.

DR. H. L. TRUMBULL, manager of chemical research, B. F. Goodrich Company, discusses more than 200 patent and other publications on rubber chemistry which appeared during 1933 in a chapter in the "Annual Survey of American Chemistry" recently published by the National Research Council.

E. F. PIERCE, associated with the Goodyear Tire and Rubber Company, Akron, Ohio, since 1926, was recently appointed manager of the Efficiency Department of that company.

H. P. FULLER, connected with the E. H. Clapp Rubber Company for a quarter century is now a member of the sales force of the Pequanoc Rubber Company, Butler, N. J., manufacturers of reclaimed rubber. Mr. Fuller is in charge of New England sales activities.

WALTER DAVOL has been named assistant managing executive of the Davol Rubber Company, Providence, Rhode Island. R. D. BERRY succeeds MR. DAVOL as assistant sales manager.

LALLEY, WEEDON RESIGN FROM KELLY-SPRINGFIELD

W. H. Lalley, recently given an indefinite leave of absence from the presidency of the Kelly-Springfield Tire Company, tendered his resignation to the board of directors of that company on July 6. The resignation was accepted and Edmund S. Burke, a vice president, was elected his successor. D. R. Weedon, appointed a vice president by Mr. Lalley two short months ago, also tendered his resignation, which was accepted.

Rumors concerning Mr. Lalley's resignation have been rampant for many months but were consistently denied. His management policies had been challenged by minority stockholders early in the year and a proxy fight ensued with the complaining minority given representation on the board of directors. Mr. Weedon was appointed a vice president during the proxy battle.

HARVEY S. FIRESTONE, SR., executive of the Firestone Tire and Rubber Company, Akron, Ohio, received the honorary degree of Doctor of Laws on June 8th at the 106th commencement of Kenyon College, Gambier, Ohio.

H. W. DELZELL, manager of technical service of the B. F. Goodrich Company tire division, led a discussion on "Rubber Tires for Farm Equipment" at the 28th annual convention of the American Society of Agricultural Engineers in Detroit last month.

JOHN WESTENDORF, executive of the Premier Rubber Mfg. Company, Dayton, Ohio, was named vice-chairman of the newly-created Dayton Metropolitan Housing Commission, on June 15th.

LUCILLE A. CARTER, technical librarian of the B. F. Goodrich Company, has been elected a vice-president of the Cleveland chapter of the Special Librarians Association.

RAYMOND A. MERTZ, formerly with the Firestone Tire and Rubber Company, has been appointed plant superintendent of the Ohio Rubber Company, Willoughby, Ohio. FRANKLIN G. SMITH, president of the concern, made the announcement on June 8th.

J. C. HERBERT, assistant counsel of the B. F. Goodrich Company, has been elected vice president and general manager of the Pacific Goodrich Rubber Company, Los Angeles.

ERNEST I. KILCUP, for several years secretary and acting treasurer of the Davol Rubber Company, Providence, R. I., has been appointed general manager of that company. He takes the place of P. RAYMOND WESLEY who died last May.

F. E. TITUS has been elected vice president of the B. F. Goodrich Company in charge of tire sales for the company's four Pacific Coast districts.

To Give Rubber Lectures

R. B. Stringfield, secretary-manager of the Dental Plastics Company, Los Angeles, will deliver a series of 12 lectures on "Rubber Technology" and "Synthetic Resins" at the Chemical Engineering Department of the University of Southern California, during the Fall and Spring terms. Mr. Stringfield was formerly chief chemist of the Goodyear Tire & Rubber Company of California.

Sir Cecil Clementi Resigns

Sir Cecil Clementi, High Commissioner for British Malaya, has resigned that post. Associated with the rubber industry by virtue of his position in the world's foremost rubber growing country, Sir Cecil witnessed the failure of the Stevenson restriction plan and was opposed to the plan recently put into effect because of the poor results in the original plan.

Changes in Fisk Rubber

William H. Benton has succeeded Leo J. Samson as general auditor of the Fisk Rubber Corporation, Chicopee Falls, Mass. Henry Levy, son of the president of the Fisk concern, has been appointed manager of the commercial mileage department. His new position includes supervision of national tire accounts.

HERMAN M. KOELLIKER and JAMES C. BARBOUR, formerly factory manager and production manager, respectively, of the Ohio Rubber Company, Willoughby, Ohio, have both become associated with the Canadian Mechanical Rubber Corporation, Orillia, Ontario, Canada.

WALTER E. RIGGOTT has succeeded HOWARD C. SMITH as director of advertising for the Fisk Rubber Corporation, Chicopee Falls, Mass. Mr. Smith resigned that position recently.

JEROME CLARKE HUNSAKER, vice-president of the Goodyear-Zeppelin Corporation, Akron, has been appointed a member of the Airmail Study Commission, by President Roosevelt.

HOWARD F. SMITH, formerly with the General Tire & Rubber Company and the Marathon Rubber Company, has been appointed "compliance director" for the retail tire and battery dealers' code.

F. E. BRADSHAW is now on the high seas bound for Monrovia, Liberia, South Africa, where he will take complete charge of the Firestone Tire & Rubber Company's plantations in that territory.

A. K. DILL has been transferred from the general offices of the U. S. Rubber Company, in New York City, to the Detroit headquarters where he will contact development and manufacturing departments. He is also in charge of bicycle tire, accessories and repair material sales.

R. D. BERRY has been advanced to the post of assistant secretary and HERBERT BEHRE to assistant sales manager of the Davol Rubber Company, Providence, R. I. These are confirmations of changes tentatively made several months ago.

NEW ENGLAND NEWS

Business of the Black Rock Mfg. Company, Bridgeport, Conn., is substantially better than a year ago, and prospects for the summer and early fall are encouraging, THE RUBBER AGE is advised. Considerable interest has been manifest by rubber manufacturers in the recent announcement that the Black Rock company has adapted its crude stock cutter to hydraulic as well as pneumatic cutting, and it can now be furnished for either type of operation.

This unit is used in all plants which cut up biscuits, smoked sheets and reclaimed rubber. Plants having hydraulic power instead of pneumatic can now utilize the cutter.

The factory building on Congress avenue, New Haven, Conn., formerly occupied by the Bauman Rubber Company, has been transferred to the Wire Rope Corporation of America for a price reported to be $25,000. Raymond H. Wulf, receiver in equity of the Bauman company, quit-claimed the property to John P. Barclay, who in turn transferred it to the Wire Rope concern.

Production of the Russell Mfg. Company, Middletown, Conn., maker of brake-lining, webbing and other products, is running far ahead of last year and in June was about equivalent to 1931, according to a recent report. It is understood that several new products will be added to the company's line in the fall, although no formal announcement has been made as yet.

Raybestos-Manhattan, Inc., Bridgeport, Conn., has started construction of a frame office building, to cost several thousand dollars, at its branch plant in Stratford, Conn.

Highland Mfg. Company, Springfield, Mass., maker of elastic specialty items in women's wear in which rubber thread is used is moving its plant from 44 Taylor Street to new quarters at 33 Lyman Street where additional space is available. Additional knitting units will be installed in the new plant. P. L. Bonnel is president; Robert Cameron, treasurer; and Ralph F. Carter, general manager.

Wallace W. De Laney, a vice-president of the Seamless Rubber Company, New Haven, Conn., addressed a meeting of the Employes' Association of the company, June 18, at which officers were elected and plans made for a company outing to be held this summer.

Stephen H. Sill, assistant foundry superintendent for Farrel-Birmingham, Inc., Ansonia, Conn., rubber mill machinery, died June 13 at Griffin Hospital, Derby, after a brief illness. Three sons and two brothers survive him. Mr. Sill was a native of Holyoke, Mass., but had been a resident of Derby for nearly 40 years.

The Foremen's Association of the United States Rubber Company, Naugatuck, Conn., held its annual clambake June 23 at Osborn's Glen. A sports program featured the day's activities, climaxed by a dinner.

Plants of the United States Rubber Co. in Naugatuck, Conn., shut down during the first two weeks of July for the annual summer vacation. More than 5,000 employees were released for the period. Operations were scheduled to resume on the same scale of production after the middle of the month.

TRENTON NEWS

Vice-Chancellor John H. Backes, at Trenton, has declared illegal the New Jersey code authority action in fixing tire prices higher than those under the national rubber code. Sears, Roebuck & Co., was charged by State authorities with selling tires at about $1 less than those set under the State code. The company's prices were in accordance with the national code, which the concern claimed took precedence over the State code. The jurist ruled in dismissing the complaint that "this is a national recovery and not merely a New Jersey recovery, and the Governor, or rather the appointed agents, over-stepped the bounds when they established prices higher than those approved by the President."

The State was seeking an injunction restraining Sears Roebuck from selling tires at prices below those prescribed in the State code. The State Attorney General charged the company with attempting to gain a monopoly of the tire business in the State and were trying to drive independent dealers out of business because of favored contracts with manufacturers.

Hugh Ross, of 223 West Trenton Avenue, Morrisville, comptroller of the Vulcanized Rubber Company, Morrisville, Pa., was seriously injured in an automobile accident at that place on June 16. He suffered severe injuries of the head and was held for some time at a Trenton hospital.

Paul E. Gunkel, manager of the Canadian plant of the Joseph Stokes Rubber Company, Welland, Ontario, who has been recuperating in Georgia, was visiting New Jersey recently.

The New Jersey Rubber Manufacturers' Association held its annual outing June 20 at the Trenton Country Club, Trenton. The day was spent in the pursuit of various games with a dinner being served at night.

S. H. Renton, head of the Vulcanized Rubber Company, Morrisville, Pa., is on a two months' vacation, traveling through various European countries.

Holand B. Slusser, vice-president and treasurer of the Pocono Rubber Cloth Company, Trenton, N. J., has returned from a lengthy business trip along the Pacific Coast.

PREPARE SOUND PROGRAM FOR SAFETY CONGRESS

Ben Gerpheide, chairman for the program to be presented at the meetings of the Rubber Section of the 23rd Annual Safety Contest, conducted annually by the National Safety Council, Inc., of Chicago, has prepared a tentative program that is bound to meet with the approval of attending delegates. This year's function is to be held in Cleveland the week of October 1, with October 2-3 set for the rubber division activities.

At present, the tentative program includes a resume of rubber section activities, and discussion of safety progress in the rubber industry, dust hazards in the rubber field, safety kinks, hazards of rubber cement churn and storage rooms, the foreman's job in training the worker, in addition to regular business transactions.

GENERAL CANADIAN PLANT HANDLES EXPORT ORDERS

The Toronto, Canada, plant of the General Tire & Rubber Company, Akron, is now handling all export business formerly handled at the Ohio headquarters of the company. Joseph A. Andreoli, vice-president of the General export division, has left Akron to take charge of affairs at the Canadian city.

In connection with the current strike at the Akron factories of the concern, Mr. Andreoli made it clear that the move was not intended with antagonism to the workers, but was a necessary move. He added that work at the Canadian plant had been speeded up and plans were in progress for triple production at the General plant in Mexico City.

New Plane for General Tire

Testing of streamline airplane tires, made by the General Tire & Rubber Company, Akron, will be made on the high speed Lockheed Vega plane recently put into commission by that company for use of its executives in contacting plants in Toronto, Canada and Mexico City. Ray W. Brown, in charge of aviation sales, is the pilot for the new ship, powered by a Pratt & Whitney motor.

Continue Edison Research

B. Y. Morrison, principal horticulturist in charge, Bureau of Plant Industry, of the U. S. Department of Agriculture, Washington, D. C., advises that arrangements were recently made to continue experimenting with a few projects initiated by the Edison Research workers, of which rubber harvested from fields of goldenrod is one. A newspaper report had it that the government had officially sanctioned the product developed by the late Mr. Thomas Edison, but Mr. Morrison's advice does not put it that strongly.

Puritan Rubber Company, Trenton, is working on large orders for rubber tiling and has engaged a number of extra employes. There has been a gain of 100 per cent over spring months.

New Rubber Goods

Rubber Stamps Feature Pigs

Fulton Specialty Company, Elizabeth, N. J., has introduced the famed Walt Disney characters, the Three Little Pigs, in rubber stamps. Another newly announced

novelty stamp by the same company portrays the features of Little Red Ridinghood, also associated with the Disney cartoons. The Fulton concern suggests featuring these whimsical characters in a tie-up with a coming movie cartoon.

Perfect Rubber Tree Filler

Experiments conducted by the Goodyear Tire & Rubber Company in conjunction with the Akron, Ohio, parks department, have resulted in the perfection of a plastic rubber substance known as tree cavity filler, that readily adheres to the cavities or scars of damaged trees and prolongs their lives indefinitely. Being plastic at all times, the new rubber cavity filler does not crack when the tree grows, nor does it shrink away from the tree as the fill dries out. Edges of fills adhere tightly all around and even after the outer surface has completely dried out, the cavity filler is sufficiently pliable to avoid cracking or any trace of separation. In addition, the new rubber tree cement is a natural black that harmonizes well with average tree colors and will hold fast even in inverted cavities.

Ideal "Snoozie" Doll

To its line of dolls with rubber arms and legs, the Ideal Novelty & Toy Company, Brooklyn, N. Y., has now added the "Snoozie" doll. This doll opens its eyes when turned from its right side over to its back and yawns realistically. It has three "voices," one in each leg and one in the body. The body itself is stuffed with Kapoc and is covered with flesh colored, specially treated rubberized cloth.

All Rubber Battery Separator

The Firestone Tire & Rubber Company announces a battery separator made exclusively of rubber that is not affected by heat, cold nor acid. It is more porous than wood, giving free flow of the energy within the battery, which means more power. It is considered as great an advancement in batteries as the balloon tire was in the tire industry. The Firestone battery factory is using it in the extra power type battery. Separators of rubber have long been the goal of the battery industry and a number of separators have been brought out combining rubber with fiber, glass, etc. Sometimes they obtained long life but usually were considerably less porous than the conventional wood separators and thus gave less starting power, especially in cold weather. This new separator is made up of millions of tiny balls of rubber joined together in such a way as to give both strength and porosity. More starting power is developed because of the free flow of energy provided by these more porous separators. They give the battery a great advantage over ordinary batteries in power during cold weather.

Improved Goodrich Tire

A newly developed truck and bus tire, with improvements over previous construction, is announced by The B. F. Goodrich Company. The new tire known as the Goodrich Triple Protected Silvertown has three new protection features, Plyflex, Ply-lock and 100 per cent Full Floating Cords, according to the manufacturer. Plyflex is a new, tough, sturdy rubber material and the new tire has a layer of it protecting the side-wall. It bears the brunt of the strains caused by the tire flexing several hundred times a minute, distributes stresses throughout the carcass and prevents local weakness. Ply-lock is a new process of locking the continuous plies of the tire around the bead, anchoring them in place and floating the tapered ply ends in rubber.

Goodrich Rubber Mat Design

Designs such as trade marks, coats of arms, emblems, and the like, can now be produced inexpensively on regular grades of corrugated rubber matting, advises the Mechanical Rubber Goods Department of the B. F. Goodrich Rubber Company, Akron, Ohio. Experimentation on this process has been conducted by Russell Colley of

the Goodrich concern since the fall of 1931. The process is known as Chromatex. Cold liquid rubber of almost any colors may be painted on the area to be designed until a certain thickness is built up, the mats then being cured and colors inlaid under pressure. Prior to this process the common practice was to gouge the design area and then insert pieces of colored rubber.

Ship Fenders Made of Rubber

A new type of rubber dock fender that absorbs the shocks of contacts which are unavoidable when warping a ship into its slip has been pioneered by Goodyear Tire & Rubber Company, Akron, Ohio. The new fenders consist of sections of rugged and toughly compounded rubber tubing,

suspended over the sides of the docks and slips in with steel cables, which are run through hollow tubes. Washers are attached to the lower ends so that the fenders can not fall off when used vertically. Practical use of the rubber fenders is made on the docks at Conneaut, Ohio, one of the principal Lake Erie ports.

New Barr Rubber Novelties

Barr Rubber Products Company, Sandusky, Ohio, continues to feature new latex balloons and novelties. Odd designs and caricatures of domestic animals familiar to children are preferred, such as the two il-

lustrations shown here. The Barr latex line includes red, yellow, blue, green and orange colors. The concern is one of the largest producers of rubber balloons and novelties in this country.

Lastex Used in Shirt Collars

Seeking an answer to the problem of shirt shrinkage, other than the advertised Sanforized process, the Commercial Shirt Corporation, 1239 Broadway, New York City, is weaving Lastex bands into the collars of its manufactured shirts. The use of this pliable product should allow for enough give to suit every variation of neck. An advertising campaign, soon to be introduced, will tell of the health dangers of tight collars, in addition to featuring the use of Lastex.

Greeting Toys of Rubber

What is believed a brand new idea, birthday greeting toys of rubber, with the greeting printed on rubber elephants, dirigibles, horses and jockeys, monkeys, dogs or cats which can be inflated into a toy has been announced by Miller Rubber Products Company, Akron, Ohio. Each of the rubber animals is imprinted with a different suitable birthday greeting.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, JULY 10, 1934

Crude Rubber

AFTER the decline in crude rubber during the last three weeks of May, prices jumped from 12¼ cents on the last of May to 13 cents on June 1 as the rubber control plan began operation. From that price quotations have risen fairly steadily to the 14⅞ cent level on the last day of June with 14¾ cents quoted today. The average price for June, on the outside market was 13.51 cents compared to 13.26 in May, and 6.15 cents in June, 1933. The strike at General caused some uneasiness in the market but as it appeared that other rubber plants would not be affected, the effect on the market was soon lost. Effective on Saturday, June 23, trading on the Commodity Exchange was suspended on all Saturdays for the balance of the summer. Denials today of rumors that Dutch natives were tapping to capacity resulted in a spirited market on the Exchange with 5,520 tons traded. Quotations in the Outside Market, Exchange, London and Singapore follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.14¾
July	—	@	.14¾
Aug.-Sept.	—	@	.14⅞
Oct.-Dec.	—	@	.15⅛
First Latex, crepe spot	—	@	.16½
Amber Crepe, No. 2	—	@	.12½
Amber Crepe, No. 3	—	@	.12¼
Amber Crepe, No. 4	—	@	.12
Brown Crepe, clean thin	—	@	.12½
Brown Crepe, rolled	—	@	.09½

Latex—

Liquid Latex, per gal.	.60	@	—

Paras—

Up-River, fine	—	@	.12
Acre Bolivian, fine	—	@	.12¼

Balata—

Block, Ciudad	—	@	.45

LONDON MARKET

Standard Smoked Sheets—Buyers—July 10			
July	—	@	7 7/16d
September	—	@	7 5/16d
Oct.-Dec.	—	@	7 3/8d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—July 10			
July	—	@	6 13/32d
Oct.-Dec.	—	@	7 5/32d

Reclaimed Rubber

Although reclaims at present levels appear to be excellent buys, rubber manufacturers are not showing as much interest in this market as conditions would warrant. Some contracts are being placed until the end of this year but in general after a period of fair activity during the past few months, reclaimers are rather quiet at this time. Production figures for May showed a slight increase over April with the percentage of reclaim to crude rising from 20.9% to 22.1%. Prices as quoted remain unchanged from our last report.

High Tensile

Super-reclaim, black	lb.	.08¾	@	.09
High Tensile Red	lb.	.07	@	.07¼

Shoe

Unwashed	lb.	.06½	@	.06¾
Washed	lb.	.08	@	.09

Tube

No. 1 (Floating)	lb.	.13	@	—
No. 2 (Compounded)	lb.	.07½	@	.07¾

Tires

Black	lb.	.05	@	.05¼
Black, selected tires	lb.	.05¼	@	.05½
Dark Gray	lb.	.06¼	@	.06½
White	lb.	.09¼	@	.09½
Truck, Heavy Gravity	lb.	.05½	@	.06
Truck, Light Gravity	lb.	.06	@	.06¼

Miscellaneous

Mechanical blends	lb.	.04¼	@	.04½

Scrap Rubber

Although crude rubber has advanced somewhat during the past month demand for scrap continues light. Rubber manufacturers have not been in the market to any great extent of late and demands from reclaimers have shown no improvement. Higher prices are looked for shortly. Current quotations follow:

(Prices to Consumers)

Auto tire peelings	ton	18.00	@	19.00
Mixed auto	ton	8.50	@	9.00
Clean solid truck tires	ton	35.00	@	37.50
Boots and shoes	ton	20.00	@	21.50
Arctics, untrimmed	ton	16.00	@	17.50
Inner tubes, No. 1	lb.	.05¾	@	.06
Inner tubes, No. 2	lb.	.03½	@	.03¾
Inner tubes, Red	lb.	.02½	@	.02⅝

Cotton

Spot cotton continued to rise during June from 11.80 on the first of the month to 12.45 on June 30 with today's quotation at the 12.70 level. June average for spot was 12.20 compared to 11.44 for May. Interest lately has been largely in crop developments. Drought conditions in the West caused concern but in the East heavy rains late in June indicated the crop would be saved. The Government report indicating a crop 1,000,000 bales smaller than expected caused an advance of about $2.00 a bale yesterday and a further rise today of a quarter cent in spot cotton brought spot quotations to the highest point since June, 1930. A short yield is looked for in the trade this year with the result that operators are again taking the buying side. Quotations on N. Y. Cotton Exchange for Middling Uplands follow:

	June 9	July 10		
	Close	High	Low	Close
July	12.06	12.48	12.35	12.46
Oct.	12.30	12.64	12.47	12.63
Dec.	12.42	12.79	12.62	12.78
March	....	12.94	12.76	12.93

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)			
Peeler, carded, 23/5/3 lb.	.43	@	—
Peeler, carded, 23/4/3 lb.	.44	@	—
Peeler, carded, 15/3/3 lb.	.41	@	—
Peeler, carded, 13/3/3 lb.	.40	@	—
Egyptian, carded, 23/5/3 lb.	.53	@	.58
Egyptian, combed, 23/5/3 lb.	.58	@	—
CHAFERS			
Carded, American, 1 1/16" lb.	.42	@	.43
Carded, American, 1" lb.	.32½	@	.34½
LENO BREAKER			
Carded, American, 1 1/16" lb.	.42	@	.43
Carded, American, 1" lb.	.32½	@	.34½

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50	lb.	—	@ .05⅝
40x40	36 in.	6.15	lb.	—	@ .05
40x36	36 in.	6.50	lb.	—	@ .04¾
48x48	40 in.	2.50	lb.	—	@ .10⅝
48x48	40 in.	2.85	lb.	—	@ .09⅝
64x68	40 in.	3.15	lb.	—	@ .10¼
56x60	40 in.	3.60	lb.	—	@ .08¾
48x44	40 in.	3.75	lb.	—	@ .07⅝
44x40	40 in.	4.25	lb.	—	@ .06¾

Ducks

Enameling	lb.	.32	@	.37½
Belting and Hose	lb.	.34	@	—
Single filling, A grade	lb.	.16¾	@	.17¼
Double filling	lb.	.17¾	@	.18¼

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 Tons

FROM JUNE 11 TO JULY 10

Date	Spot	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sales
June 11	13.33	13.26	13.36	13.50	13.64	13.76	13 87	13.98	14.15	14.23	14.31	14.42	14.55	——	374
12	13.56	13.54	13.62	13.76	13.93	14.05	14.15	14.28	14.35	14.46	14.57	14.68	14.79	——	600
13	13.75	13.77	13.82	13.91	14.11	14.24	14.34	14.46	14.61	14.69	14.78	14.90	15.03	——	725
14	13.50	13.45	13.53	13.66	13.80	13.92	14.02	14.13	14.27	14.34	14.45	14.57	14.69	——	376
15	13.50	13.49	13.57	13.71	13.86	13.99	14.11	14.23	14.37	14.46	14.55	14.66	14.77	——	259
16	13.68	13.70	13.77	13.89	14.01	14.13	14.27	14.41	14.57	14.65	14.74	14.85	14.96	——	226
17															
18	13.64	13.60	13.67	13.81	13.96	14.09	14.20	14.32	14.45	14.55	14.65	14.77	14.89	——	127
19	13.50	13.42	13.49	13.63	13.78	13.91	13.03	14.15	14.30	14.42	14.55	14.67	14.79	——	323
20	13.50	13.42	13.48	13.61	13.75	13.88	14.00	14.13	14.24	14.35	14.46	14.58	14.70	——	376
21	13.38	13.30	13.36	13.50	13.66	13.79	13.90	14.01	14.10	14.22	14.33	14.48	14.64	——	254
22	13.38	13.32	13.38	13.52	13.66	13.80	13.91	14.03	14.12	14.24	14.35	14.50	14.65	——	337
23															
24															
25	13.50	13.50	13.55	13.69	13.83	13.96	14.08	14.20	14.35	14.45	14.55	14.67	14.80	——	298
26	13.75	13.71	13.76	13.90	14.04	14.16	14.29	14.42	14.55	14.67	14.80	14.91	15.03	——	496
27	13.75	13.69	13.74	13.87	14.00	14.14	14.26	14.39	14.51	14.63	14.75	14.87	15.00	——	338
28	13.96	13.90	13.95	14.07	14.20	14.33	14.44	14.55	14.69	14.81	14.93	15.05	15.18	——	489
29	14.06	——	14.06	14.20	14.33	14.47	14.58	14.72	14.84	14.94	15.03	15.15	15.28	——	408
30															
July 1															
2	13.94	——	13.91	14.04	14.18	14.31	14.43	14.55	14.67	14.77	14.88	15.00	15.12	15.24	147
3	14.31	——	14.27	14.39	14.52	14.64	14.76	14.89	15.00	15.10	15.21	15.33	15.46	15.58	459
4															
5	14.75	——	14.71	14.84	14.98	15.10	15.23	15.37	15.49	15.61	15.73	15.85	16.01	16.15	763
6	14.56	——	14.56	14.68	14.81	14.86	15.00	15.14	15.28	15.38	15.49	15.66	15.83	15.96	496
7															
8															
9	14.56	——	14.54	14.67	14.80	14.93	15.05	15.17	15.29	15.39	15.50	15.62	15.75	15.88	145
10	14.75	——	14.75	14.88	15.02	15.16	15.29	15.42	15.56	15.65	15.75	15.88	16.02	16.14	552

Rubber CHEMICAL Markets

NEW YORK, JULY 9, 1934

[All Quotations F.O.B. Works Unless Otherwise Noted]

ACCELERATORS

Organic			
A-1	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
Aldehyde ammonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.46 @	.47
Diphenylguanidine	lb.	.36 @	.37
Ethylidene aniline	lb.	.45 @	.47½
Formaldenyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lead Oleate, No. 999	lb.	.10 @	—
Witco	lb.	.10 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsol X	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
R-2 Base	lb.	4.55 @	5.00
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.20 @	.23
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.06¾ @	—
Magnesia, calcined, heavy	cwt.	4.00 @	4.50

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.36 @	.38
Ultramarine	lb.	.07 @	.10
Browns			
Sienna, Italian	lb.	.06 @	'13
Umber, Turkey	lb	.04 @	.04½
Greens			
Chrome, light	lb.	.23 @	.26
medium	lb.	.24 @	.27
dark	lb.	.27 @	.30
Chromium Oxide, bbl.	lb.	.23 @	.27
Reds			
Antimony			
crimson, 15/7	lb.	.45 @	—
sulfur, free	lb.	.48 @	.52
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Lithopone			
Albalith, black label—11	lb.	.04½ @	.04¾
Azolith	lb.	.04½ @	.04¾
Rayox	lb.		
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
XX—20 Zinc Sulphide, bbls.	lb.	.11 @	.11¼
XX—86 Zinc Sulphide, bbls.	lb.	.11 @	.11¼
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½ @	.06¾
ZZ (leaded)	lb.	.06¼ @	.06½
Horsehead Lead Free Brand:			
Special—3	lb.	.06½ @	.06¾
XX Red—4	lb.	.06½ @	.06¾
XX Red—72	lb.	.06½ @	.06¾
XX Red—78	lb.	.06½ @	.06¾
XX Red—103	lb.	.06½ @	.06¾
U. S. P.—X, bbls.	lb.	.12½ @	.12¾
Kadox, black label—15	lb.	.09⅜ @	.09⅝
Blue label—16	lb.	.08⅜ @	.08⅝
Red label—17	lb.	.07 @	.07¼
St. Joe, black label	lb.	.06½ @	.06¾
green label	lb.	.06½ @	.06¾
red label	lb.	.06½ @	.06¾
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.06½ @	.06¾
Anaconda, selected lead free	lb.	.06¾ @	.07
Florence White seal—7 bbls.	lb.	— @	.10⅝
Green seal—8	lb.	.09⅜ @	.09⅝
Red seal—9	lb.	.08⅜ @	.08⅝
Yellows			
Chrome	lb.	.15 @	.16
Ocher, dom. med.	lb.	.01½ @	.02

BLACKS

Arrow "Aerfloted" Specification	lb.	.0535 @	.0825
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.0535 @	.0825
uncompressed	lb.	.0535 @	.0825
"Certified," Cabot	lb.	.0535 @	.0825
Spherons	lb.	.0535 @	.0825
"Disperso"	lb.	.0535 @	.0825
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0535 @	.0825
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.06 @	.08
"Micronex"	lb.	.0535 @	.0825
"Supreme"	lb.	.0535 @	.0825
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Kosmos"	lb.	.0535 @	.0825

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85	@24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00	@15.00
Barium carbonate (98-100%)	ton	56.50	@61.50
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	10.00	@18.00
Western prime white	ton	23.00	@30.00
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	42.50	@75.00
Calcene	ton	35.00	@45.00
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00	@75.00
heavy	ton	45.00	@55.00
Clay, Kaolin, domestic	ton	7.50	@15.00
Aerfloted, Suprex	ton	7.50	@10.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Lexington	ton	10.00	@22.00
McNamee	ton		
Par	ton		
Tensulite		15.00 @	—
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.20 @	.30
medium white	lb.	.14 @	.19
Kalite No. 1	ton	30.00	@55.00
Kalite No. 3	ton	40.00	@65.00
Magnesia, carbonate	lb.	.06 @	.06¾
Mica	lb.	.04 @	—
Rottenstone (powdered)	lb.	.02½ @	.05
Soapstone, powdered	ton	16.00	@22.00
Starch, powdered	cwt.	2.81	@ 3.01
Talc, domestic	ton	12.00	@15.00
Pyrax A	ton		
Whiting, commercial	ton	17.00	@18.00
English Cliffstone	ton	33.00	@43.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.10½ @	—
Zinc Stearate	lb.	.23 @	—

MINERAL RUBBER

Genasco (factory)	ton	25.00	@27.00
Hard Hydrocarbon	ton		
Parmr, solid	ton	21.00	@26.00
Pioneer, MR, solid	ton		
Pioneer-granulated	ton		

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.90
Tartaric, crystals	lb	.26 @	—
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.08 @	.12
Alkalies			
Caustic Soda, 76%	cwt.	3.60 @	—
Soda Ash, 58% C.L.	cwt.	2.52 @	—
Oils			
Corn, refined, bbls	lb	.06¾ @	.07¼
Cottonseed, crude	gal.	— @	.04
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¾ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¼ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.03¾ @	.04
Niger	lb.	.03⅜ @	.03½
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02½ @	—
Pigmentaroil, tank cars	gal.	.14 @	—
in drums	gal.	.20 @	.21½
Pine, steam distilled	gal.	.59 @	.61
dest. dist., drums	gal.	.50 @	.53
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.07½ @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Wobonite, c.l.	lb.	.05 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05 @	.06
coal tar	gal.	.05½ @	.06
pine, 200 lb. gr. wt.	bbl.	6.00 @	—
Rosin, grade K, 280 lb.	bbl.	6.00 @	—
Pigmentar, tank cars	gal.	.14 @	—
in drums	gal.	.20 @	.21½
Tar Retort, drums	bbl.	12.50 @	—
Solvents			
Acetone, pure	lb.	.11 @	—
Alcohol, denatured,			
No. 1 bbls.	gal.	.43 @	—
Benzol, 90%	gal.	— @	.24
Bondogen	lb.	— @	—
Carbon, bisulfide	lb.	.05 @	.06
Carbon, tetrachloride	lb.	.06 @	—
Dichlorethylene	lb.	.29 @	—
Dipentene	gal.	.31 @	.41
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Plastogen	lb.		
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.55 @	—
wood	gal.	.50 @	—
dest. dist., drums	gal.	.43 @	.45
Waxes			
Beeswax, white	lb.	.34 @	.37
Carnauba	lb.	.20 @	.38
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.10 @	.11
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.03⅝ @	—
White crude scale 124/126	lb.	.03⅝ @	—
Refined, 125/127, 138/140	lb.	.04¾ @	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-A and Flectol-B	lb.	.54 @	.62
Neozone	lb.		
Oxynone	lb.	.66 @	.90
Resistox	lb.	.52 @	.65
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Dipex	lb.	.06 @	.08
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Zip	lb.	— @	—

SUBSTITUTES (FACTICE)

Amberex	lb.	.13¾ @	—
Black	lb.	.08½ @	—
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11½

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½ @	.04½
Sulfur flour,			
Refined, 100% pure (bage)	cwt.	2.50 @	3.40
Commercial (bags)	cwt.	1.55 @	2.50
Telloy	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Re-exports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	427,280
1932:							
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Sept.	28,956	1,774,403	2.73	2,388	241,960	4.54	26,568
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933:							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419
Feb.	22,603	1,554,086	3.12	1,244	102,129	3.73	21,359
Mar.	27,936	1,867,657	2.98	1,127	86,216	3.42	26,809
April	20,240	1,291,136	2.85	798	70,111	3.92	19,442
May	26,002	1,694,963	2.93	1,842	189,451	4.59	24,894
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394
Dec.	39,461	5,869,556	6.75	1,888	293,690	6.94	37,573
1934:							
Jan.	47,963	7,403,123	6.89	1,975	352,116	7.96	45,988
Feb.	34,335	5,262,711	6.84	2,133	476,232	9.97	32,202
Mar.	41,119	6,765,173	7.34	2,947	583,313	8.83	38,172
April	43,841	8,232,746	8.37	2,814	588,453	9.18	41,027
May	48,494	10,001,239	9.21	2,389	544,212	10.17	46,105

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex (1) Tons	Liquid Latex (1) Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1933	—	—	1,658	2,261,869	5,989	944,895	11,085	1,833,671
1933:								
May	—	—	35	9,869	463	55,560	734	71,008
June	—	—	759	1,514,296	466	61,229	604	66,827
July	—	—	238	76,141	638	79,049	618	85,636
Aug.	—	—	272	527,147	390	55,509	1,156	196,138
Sept.	—	—	65	30,738	761	149,296	1,343	267,516
Oct.	—	—	119	47,663	542	99,249	1,561	310,531
Nov.	—	—	31	11,252	626	125,160	1,239	282,065
Dec.	—	—	42	20,008	708	143,868	1,290	270,533
1934:								
Jan.	—	—	98	43,932	766	169,966	1,126	239,054
Feb.	—	—	68	36,346	453	102,471	885	193,732
Mar.	51	9,464	145	51,080	25.	43,532	1,134	257,545
April	100	18,928	128	50,965	533	98,658	1,334	321,390
May	100	18,928	143	65,471	538	95,710	1,407	368,642

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1927	1928	1929	1930	1931	1932	1933	1934
Jan.	31,518	34,403	43,002	36,194	28,557	29,648	21,661	40,413
Feb.	30,137	33,702	41,594	33,302	28,797	31,821	21,638	40,609
Mar.	36,141	35,688	44,730	35,540	32,788	29,505	18,047	47,097
Apr.	35,871	32,772	47,521	39,686	33,321	27,515	25,928	44,947
May	34,592	37,333	49,233	39,386	37,817	30,957	44,074	43,012
June	33,801	37,676	43,227	34,195	37,916	41,475	51,326	.....
July	29,219	37,407	41,526	29,508	31,397	29,976	50,184	.....
Aug.	33,460	42,927	38,274	30,850	27,586	23,721	44,939	.....
Sept.	27,214	39,882	34,707	25,515	23,638	23,847	35,686	.....
Oct.	26,790	40,857	34,800	27,516	22,277	22,286	31,906	.....
Nov.	26,792	37,461	27,659	23,691	22,943	23,231	29,162	.....
Dec.	25,492	31,232	25,531	21,687	21,409	18,015	29,087	.....
Tot.	371,027	441,340	469,804	375,980	348,986	332,000	405,689	.....

Figures on Quarterly Basis

Quarter	1926	1927	1928	1929	1930	1931	1932	1933
Jan./Mar.	94,301	99,216	103,558	128,565	101,610	89,652	85,309	64,326
Apr./June	87,109	103,242	103,500	139,292	112,229	107,755	92,643	125,126
July/Sept.	93,793	89,210	117,573	113,746	85,261	83,632	72,523	132,406
Oct./Dec.	83,212	80,860	117,597	84,872	72,020	65,645	64,145	94,198
Totals	358,415	372,528	442,227	466,475	371,120	346,684	314,620	416,056

Note—The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,000
1926	180,582	164,500	45.9	23,213	1931	133,351	124,126	33.9	19,257
1927	189,144	178,471	47.6	24,980	1932	75,608	77,504	23.4	16,354
1933:									
Jan.	5,301	4,811	21.0	16,262	July	12,049	10,317	20.6	14,108
Feb.	4,578	4,363	20.2	16,570	Aug.	11,708	9,446	21.0	15,037
Mar.	3,847	3,454	19.1	15,496	Sept.	10,435	7,862	22.0	15,869
Apr.	4,617	4,407	13.1	14,370	Oct.	9,466	7,212	22.6	17,748
May	8,366	7,770	17.4	13,734	Nov.	9,063	6,335	21.7	19,170
June	10,591	9,674	18.8	13,231	Dec.	9,539	5,951	20.5	20,746
1934:									
Jan.	9,828	7,000	17.3	24,263	July	....	....	...	....
Feb.	9,504	7,646	18.8	23,356	Aug.	....	....	...	....
Mar.	11,479	9,683	20.6	25,113	Sept.	....	....	...	....
Apr.	10,185	9,387	20.9	22,033	Oct.	....	....	...	....
May	10,848	9,500	22.1	22,887	Nov.	....	....	...	....
June	....	....	...	....	Dec.	....	....	...	....

* Stocks on hand at the end of month or year.
(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1932	1933	1934		1932	1933	1934
January	26,038	26,510	29,416	August	35,706	37,426	.....
February ...	25,378	23,312	25,048	September ..	33,828	34,303	.....
March	29,597	28,227	30,528	October	32,680	32,973	.....
April	31,234	30,176	32,735	November ..	29,895	30,262	.....
May	32,016	33,999	.....	December ..	27,110	28,787	.....
June	39,489	37,710	.....				
July	30,929	34,458	.....	Total	373,900	378,143	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1932																																
February ..	4¾	4¾	4½	4½	4½	4½	—	4½	4½	4	4	3⅝	4½	3⅝	4½	4⅜	4	4	4	4	—	—	—	4	3⅝	3¾	3¾	—	—	—	4
March	3½	3½	3½	3½	3½	—	3⅝	3	3	3⅝	3⅝	3⅝	3	3⅝	3	3⅜	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
April	3	3	2⅞	3	3	3	2⅞	3	3	3	3	2⅞	3	2⅞	3	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞
May	3	3	3	3⅛	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
June	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	—	2⅝
July	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	—	2⅝
August	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	—	3⅛
September .	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	—	4⅛
October ...	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	—	3⅝
November .	3⅜	3⅜	3⅜	—	3⅜	3⅜	—	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	—	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	—	3⅜
December .	3⅜	3⅜	3⅜	—	3⅜	3⅜	—	3⅜	3⅜	3⅜	—	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	—	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	—	3⅜
1933																																
January ...	—	—	3⅛	3⅛	3⅛	3⅛	2⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	2⅛	2⅛	2⅛	2⅛	3
February ..	2⅛	2⅛	3	2⅛	2⅛	3	2⅛	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2⅛	2⅛	2⅛	2⅛	3
March	2⅞	—	2⅞	3	3	3	2⅞	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
April	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
May	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝
June	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝
July	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜
August	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝	7⅝
September .	7¾	7¾	7¾	8	7¾	8	7¾	8	8	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾	7¾
October ...	7⅞	7⅞	7⅞	8⅛	7⅞	8	7⅞	8	8⅛	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞
November .	7⅞	7⅞	8	8⅛	7⅞	8	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛	8⅛
December .	9¼	9¼	—	9¼	9¼	9¼	9⅛	8⅝	8⅝	—	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝
1934																																
January ...	—	9	—	9	9	9	—	8¾	8¾	8¾	8¾	8⅝	8⅝	8⅝	8⅝	8⅝	9⅛	9⅛	9⅛	9⅜	10⅛	9⅝	9⅝	9⅝	9⅛	10⅛	10⅛	—	10⅝	10	10	9⅝
February ..	9⅝	10⅛	9⅝	10⅛	10⅛	10⅛	10⅛	10⅛	10⅛	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝
March	10⅛	10⅛	10⅛	10⅝	10⅝	10⅝	10⅝	10⅝	10⅝	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛	11⅛
April	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝	11⅝
May	14⅛	14⅛	14⅛	15	15⅛	15½	15⅛	14	14	13¾	13¾	12⅝	13⅜	13½	13⅜	13⅜	13⅜	13⅜	13½	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜
June	13	13	12¾	14⅜	13⅜	13⅜	13¼	13¼	13¼	13¼	13¼	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜	13⅜
July	—	14	14⅜	—	14⅜	14⅜	14⅜	—	—	14⅜	14⅜	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1928

Month	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	40.25	20.14	15.24	8.34	4.38	3.08	9.32
Feb.	32.75	23.97	15.35	7.70	4.03	2.95	10.45
Mar.	26.82	24.55	15.34	7.71	3.35	3.01	11.01
Apr.	18.97	21.18	14.93	6.43	3.02	3.56	12.10
May	18.99	21.46	14.24	6.49	3.09	4.95	13.26
June	19.59	20.64	12.45	6.35	2.66	6.15	13.51
July	19.40	21.30	11.24	6.37	2.89	8.01	....
Aug.	19.46	20.59	9.96	5.38	3.63	7.31	....
Sept.	18.47	20.37	8.28	5.08	3.84	7.30	....
Oct.	18.83	19.67	8.20	4.87	3.65	7.64	....
Nov.	18.26	16.62	9.01	4.65	3.44	8.66	....
Dec.	17.97	16.12	9.05	4.64	3.24	8.87	....
Average for Year	22.48	20.55	11.98	6.17	3.49	5.96	....

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1	—	6¾	6¼	—	17	5⅜	6⅛	—	
2	—	6⅞	6¼	6¼	18	5⅜	6⅛	6⅜	
3	5⅜	6⅞	—	6⅛	19	5⅜	—	6½	
4	5⅞	7⅛	6⅛	7⅛	20	5⅜	—	6⅝	
5	5⅞	7¼	6⅞	7⅛	21	5⅞	—	6⅜	
6	5⅜	—	6⅞	7⅛	22	—	6⅜	6⅜	
7	5⅜	7¼	6⅞	7	23	5⅜	5⅜	—	
8	—	7⅞	6½	—	24	5⅜	5⅜	—	
9	5⅜	6⅜	6½	7	25	5⅜	5⅞	6⅜	
10	5⅜	6⅜	—		26	5⅜	5⅜	6⅜	
11	5⅞	6⅞	6⅜		27	6⅛	—	6¾	
12	5⅜	6⅜	6⅜		28	6⅛	5⅜	6¾	
13	5⅜	—	6⅜		29	—	5⅜	6⅞	
14	5⅜	5⅜	6½		30	6⅜	5¾	6⅜	
15	—	6⅞	6⅞		31	—	5⅜	—	
16	5⅜	6⅞	6⅞						

Average Monthly Price Per Pound

Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence	Month	1931 Pence	1932 Pence	1933 Pence	1934 Pence
Jan.	4.160	3.052	2.264	4.429	Aug ...	3.385	2.654	3.811	
Feb.	3.823	2.760	2.093	4.920	Sept. ..	2.524	2.485	3.728	
Mar.	3.822	2.047	2.099	5.136	Oct.	2.898	2.425	3.957	
Apr.	3.082	1.876	2.323	5.712	Nov. ..	2.890	2.518	4.096	
May	3.035	1.825	2.966	6.207	Dec. ..	3.115	2.444	4.200	
June	3.082	1.750	3.392	6.245	Average for				
July	3.048	1.875	3.860		Year ...	3.155	2.434	3.233	

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	May	June	July	Date	May	June	July	Date	May	June	July
1	10.75	11.80	—	11	11.45	12.15		21	11.55	12.20	
2	11.00	11.95	12.10	12	11.45	12.30		22	11.50	12.10	
3	11.00	—	12.30	13	—	12.30		23	11.50	12.15	
4	11.30	11.85	—	14	11.40	12.15		24	11.40	—	
5	11.20	12.10	12.30	15	11.45	12.15		25	11.50	12.35	
6	—	12.10	12.15	16	11.55	12.15		26	11.60	12.45	
7	11.45	12.20	12.10	17	11.70	—		27	—	12.35	
8	11.65	12.15	—	18	11.60	12.15		28	11.60	12.45	
9	11.50	12.25	12.45	19	11.65	12.35		29	11.60	12.35	
10	11.55	—		20	—	12.20		30	—	12.45	
								31	11.55	—	

Average Monthly Price Per Pound

	1931 Cents	1932 Cents	1933 Cents	1934 Cents		1931 Cents	1932 Cents	1933 Cents	1934 Cents
Jan.	10.27	6.65	6.23	11.25	Aug. ...	7.21	7.43	9.55	
Feb. ...	10.96	6.85	6.05	12.28	Sept. ...	6.52	6.30	9.64	
Mar. ...	10.90	6.86	6.39	12.30	Oct. ...	6.32	6.30	9.58	
Apr. ...	10.19	6.16	7.02	11.80	Nov. ...	6.44	6.22	10.04	
May ..	9.38	5.72	8.64	11.44	Dec. ...	6.25	6.00	10.17	
June ...	9.05	5.02	9.47	12.20	Average for				
July ...	9.28	5.87	10.76		Year ...	8.56	6.41	8.63	

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND			AFLOAT			ON HAND AND AFLOAT		
	1932	1933	1934	1932	1933	1934	1932	1933	1934
Jan.	322,860	396,376	368,660	42,234	32,539	45,768	365,094	428,915	414,428
Feb.	318,936	381,794	357,094	51,728	32,898	53,063	370,604	414,692	410,157
Mar.	329,586	390,135	353,242	44,190	29,531	54,722	373,776	419,666	405,786
Apr.	336,957	382,167	351,981	40,387	30,745	56,251	377,344	412,912	408,232
May	336,719	364,623	351,329	50,453	43,342	57,921	387,172	407,965	409,250
June	334,657	333,954		43,079	63,608		377,736	397,562	
July	333,729	326,609		37,894	57,435		371,623	384,044	
Aug.	342,888	325,148		42,846	53,084		385,734	378,232	
Sept.	346,154	334,637		46,188	57,255		342,342	391,892	
Oct.	358,282	343,579		40,176	58,568		398,458	402,147	
Nov.	360,386	353,852		40,879	57,140		401,265	410,992	
Dec.	379,000	364,541		38,360	55,606		417,360	419,147	

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1932	1933	1934	At end of	1932	1933	1934
Jan.	67,166	36,481	38,570	July	48,842	41,178	
Feb.	65,942	37,182	38,752	Aug.	47,079	39,480	
Mar.	64,280	40,689	40,501	Sept.	44,942	39,237	
Apr.	61,848	40,911	42,413	Oct.	42,327	37,101	
May	56,089	41,998	42,190	Nov.	40,606	36,139	
June	51,009	43,032		Dec.	37,407	35,615	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1934					
January	36,478	37,326	38,333	38,537	
February	39,064	39,509	40,133	39,775	
March	39,680	39,670	40,174	40,178	40,480
April	40,994	41,458	41,589	42,539	
May	41,815	42,908	41,900	42,118	
June	42,503	43,308	43,709	44,157	45,711
July	47,607				

Stocks in Liverpool

1934				
January	51,434	51,897	52,256	52,037	
February	51,937	52,615	52,920	52,944	
March	52,832	53,488	53,929	54,109	54,004
April	54,464	53,832	54,119	53,917	
May	53,915	54,268	54,123	54,276	
June	54,103	54,294	54,327	54,228	54,161
July	54,966				

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1931	1932	1933	1934	End of	1931	1932	1933	1934
Jan.	48,802	48,850	22,525	40,405	July	51,203	17,017	36,972	
Feb.	49,283	46,954	21,530	41,884	Aug.	48,971	20,649	38,601	
Mar.	49,590	46,591	24,594	47,933	Sept.	47,025	20,415	36,948	
Apr.	45,868	39,663	25,460	48,431	Oct.	52,132	23,158	37,282	
May	44,278	38,690	29,822	76,393	Nov.	46,947	25,419	39,018	
June	47,517	19,770	34,676		Dec.	45,795	25,341	38,269	

STOCKS IN OTHER CENTRES

End of:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Mar., 1933	33,494	26,180	2,183	3,779	5,780
Apr.	33,391	27,710	2,214	3,428	5,204
May	32,613	24,090	1,534	3,177	4,790
June	35,919	22,930	1,147	2,913	4,321
July	35,020	22,900	1,007	3,208	3,830
Aug.	36,756	22,000	1,033	3,411	3,588
Sept.	36,083	25,900	1,107	4,286	3,288
Oct.	37,302	28,320	1,411	4,889	3,237
Nov.	36,965	38,530	1,285	5,575	3,383
Dec.	38,441	36,700	1,052	5,792	2,981
Jan., 1934	36,788	9,250	1,115	7,271	3,305
Feb.	39,630	6,563	906	5,366	3,420
Mar.	37,275	3,365	904	4,083	3,519
Apr.	33,765	38,000	905	4,070	3,624
May	7,213	40,000	....	....	3,556

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1924	21,863,311	1928	24,247,282	1932	6,261,336
1925	26,001,664	1929	24,141,502	1933	8,713,962
1926	24,199,524	1930	17,364,096	1934	.....
1927	19,700,003	1931	11,253,800	1935	.....
1934:		1934:		1934:	
January	789,274	May	1,140,132	September	.....
February	1,262,311	June	1,015,730	October	.....
March	1,651,548	July	.....	November	.....
April	1,635,722	August	.....	December	.....

U. S. Tire and Tube Statistics[1]

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1926	1927	1928	1929	1930	1931	1932	1933
Production	61,237	64,439	77,944	68,726	50,965	48,739	40,085	45,304
Shipments	59,002	64,059	74,296	69,395	53,638	48,151	40,260	44,094
Inventory[2]	10,456	10,264	13,624	11,838	9,003	7,775	7,644	8,888

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1932	1933	1934	1932	1933	1934	1932	1933	1934
Jan.	3,462	2,258	3,922	3,253	2,597	3,222	7,912	7,237	9,684
Feb.	3,871	2,339	4,335	2,553	2,292	3,285	9,172	7,377	10,725
Mar.	3,671	2,038	5,180	2,954	2,092	4,223	9,878	7,290	11,651
Apr.	3,517	3,123	4,470	3,698	3,654	4,438	9,846	6,778	11,981
May	3,820	5,189		4,258	5,180		9,379	6,760	
June	5,643	6,100		10,065	6,305		4,999	6,615	
July	3,617	5,714		2,404	5,497		6,203	6,844	
Aug.	3,089	4,994		2,655	4,707		6,659	7,070	
Sept.	2,539	3,999		3,082	3,503		6,096	7,595	
Oct.	2,569	3,429		1,799	2,537		6,876	8,462	
Nov.	2,304	3,039		1,711	2,197		7,454	9,247	
Dec.	1,983	3,082		1,819	3,531		7,644	8,888	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1926	1927	1928	1929	1930	1931	1932	1933
Production	76,618	70,823	80,180	68,829	52,420	48,333	36,891	42,546
Shipments	71,591	72,896	77,127	70,592	54,938	50,021	37,911	41,391
Inventory[2]	16,200	13,692	16,117	12,807	9,999	7,922	6,749	7,815

Figures for Recent Months

	PRODUCTION			SHIPMENTS			INVENTORY		
	1932	1933	1934	1932	1933	1934	1932	1933	1934
Jan.	3,308	2,093	3,530	3,529	2,535	3,199	7,719	6,197	8,403
Feb.	3,281	2,224	4,077	2,728	2,102	3,323	8,760	6,357	8,445
Mar.	3,502	1,883	5,194	2,686	1,902	4,118	9,448	6,369	10,244
Apr.	3,225	2,853	4,735	3,385	3,051	4,342	9,441	6,189	10,585
May	3,409	4,700		3,867	4,463		8,913	6,382	
June	5,279	5,448		9,019	5,778		5,174	6,097	
July	2,937	5,603		2,160	5,211		5,975	6,440	
Aug.	2,748	4,916		2,503	4,687		6,127	6,628	
Sept.	2,601	3,827		3,098	3,472		5,753	7,008	
Oct.	2,187	3,506		1,658	2,676		6,214	7,831	
Nov.	2,005	2,863		1,578	2,103		6,662	8,625	
Dec.	1,779	2,631		1,724	3,410		6,749	7,815	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete for 1929-1933. Beginning 1934, the Association reported its figures to be 97% complete.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States			Canada			Grand Total
	Total	Passenger Cars	Trucks	Total	Passenger Cars	Trucks	
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933*	1,927,256	1,586,338	340,918	65,924	53,855	12,069	1,993,180
1933*							
Apr.	180,713	153,350	27,363	8,255	6,957	1,298	188,968
May	218,347	184,698	33,649	9,396	8,024	1,372	227,743
June	253,387	211,483	41,904	7,323	6,005	1,318	260,710
July	233,141	195,023	38,118	6,540	5,322	1,218	239,681
Aug.	236,556	195,144	41,412	6,079	4,919	1,160	242,635
Sept.	196,143	160,900	35,243	5,808	4,358	1,450	201,951
Oct.	138,542	108,073	30,469	3,682	2,723	959	142,224
Nov.	63,987	44,429	19,558	2,291	1,503	786	66,278
Dec.	84,152	53,900	30,252	3,262	2,171	1,091	87,414
1934							
Jan*	156,907	113,652	43,255	6,904	4,946	1,958	153,811
Feb.*	231,707	187,666	44,041	8,571	7,101	1,470	240,278
Mar.*	331,263	274,738	56,625	14,180	12,272	1,908	345,443
Apr.*	354,745	289,031	65,714	18,363	15,451	2,912	373,108
May	331,641	273,765	57,876	20,161	16,504	3,657	351,802

* Revised.

Exports of Crude Rubber from Principal Producing Countries

Long Tons

	BRITISH MALAYA [1]							DUTCH EAST INDIES [5]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon [2]	India & Burma [3]	Sarawak [4]	British North Borneo [3]	Siam [4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China [3]	Amazon Valley	All Other [6]	World Total [7]
1923	252,816	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,562	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	805	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,801	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,602	318	590	458	305	4,766	5,630	6,840	1,957	554	125*	58,887
Feb.	37,564	6,167	31,397	5,064	304	541	458	368	4,895	5,119	6,081	895	620	125*	55,867
Mar.	42,059	7,964	34,095	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	125*	61,501
Apr.	36,752	7,758	28,994	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	125*	56,435
May	42,902	13,664	29,238	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	125*	66,078
June	41,411	16,538	24,873	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	125*	63,794
July	50,531	18,772	31,759	4,201	270	1,358	728	797	7,367	8,580	16,534	1,310	913	125*	73,942
Aug.	52,266	17,869	34,397	5,839	246	955	728	926	6,460	7,985	15,161	808	1,116	125*	74,746
Sept.	49,607	15,146	34,461	5,111	125	1,027	728	611	5,868	9,164	15,005	1,702	656	125*	74,455
Oct.	61,002	17,390	43,612	5,674	271	959	750*	979	6,329	8,692	15,170	1,513	965	125*	84,879
Nov.	54,599	20,142	34,457	6,097	516	1,020	750*	1,191	6,684	9,951	14,474	1,599	956	125*	77,820
Dec.	57,579	18,110	39,469	7,062	964	989	750*	1,046	7,030	10,183	17,274	2,173	930	125*	87,995
1934:															
Jan.	55,055	21,184	33,871	7,551	1,531	1,197	750*	1,290	6,513	8,974	17,718	2,158	576	125*	82,254
Feb.	57,867	19,688	38,179	8,354	775	1,005	750*	1,264	6,706	10,277	17,466	1,100	831	125*	86,832
Mar.	58,515	26,470	32,045	6,954	1,412	1,360	750*	1,363	8,655	12,043	25,064	1,316	846	125*	91,933
Apr.	56,748	27,963	28,785	5,783	762	1,447	750*	1,311	7,282	11,324	24,054	1,519	440	125*	83,582
May	69,403	34,093	35,310	7,528	.....	1,892	750*	997	12,104	16,720	34,710	1,408	726	125*	.....
June	53,282	20,981	32,301	3,305	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,496	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	.....	.....	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,243	7,831	5,520	10,402	.....
1933:															
Feb.	22,970	7,102	6,603	4,460	1,175	8,508	993	2,820	2,001	1,670	375	564	132	681	60,055
Mar.	27,348	8,883	6,093	4,425	1,114	6,035	1,604	2,088	1,904	952	282	649	340	688	62,405
Apr.	20,236	7,765	6,308	4,805	555	5,495	2,207	2,274	1,580	882	163	606	281	400	53,565
May	24,894	11,085	4,144	4,622	1,704	5,289	1,278	1,691	425	710	—525	536	433	432	56,718
June	22,228	8,739	4,056	3,639	1,441	3,330	1,997	2,000	613	469	—519	772	541	400	49,706
July	43,824	3,961	3,774	4,103	1,192	1,460	1,146	2,952	2,347	299	16	486	435	287	66,282
Aug.	43,208	4,330	5,251	4,193	1,795	4,424	1,249	3,312	1,500	325	209	616	606	2,759	73,779
Sept.	43,886	4,341	4,111	5,841	2,620	5,369	2,055	2,168	794	864	186	604	790	577	74,211
Oct.	43,366	3,373	4,921	4,772	2,580	6,150	1,836	2,084	604	1,118	310	777	441	686	73,081
Nov.	39,633	3,955	5,419	4,086	2,184	6,296	942	4,483	301	1,129	222	878	493	882	70,903
Dec.	38,864	6,524	5,415	4,933	1,773	6,865	1,029	2,400	190	1,360	213	703	776	1,772	72,817
1934:															
Jan.	47,114	9,503	6,843	6,057	1,721	5,628	2,517	2,749	566	2,173	381	1,185	484	1,355	88,276
Feb.	33,087	10,785	7,375	5,490	1,854	4,570	2,388	3,399	950	1,538	287	464	656	516	73,357
Mar.	39,306	14,008	7,871	6,453	3,411	5,655	1,394	4,018	671	965	284	836	394	976	86,242
Apr.	42,262	9,999	8,192	6,701	2,419	5,679	1,966	.....	415	504	262	1,217	752	465	.....
May	47,412	9,786	.....	6,499	.....	.....	.....	.....	.....	.....	322	.....	.....	.....	.....

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemicals and Compounding Materials —

ACCELERATORS—
Ureka C—Ureka Blend B—Ureka.—A-1, A-7, A-11, A-16, A-19, A-32, Z-88, A-510, DPG
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